

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Advanced Television Systems)
and Their Impact upon the) MM Docket No. 87-268
Existing Television Broadcast)
Service)

SIXTH REPORT AND ORDER

Adopted: April 3, 1997

; Released: April 21, 1997

By the Commission: Chairman Hundt and Commissioners Quello, Ness and Chong issuing
separate statements.

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I. INTRODUCTION

1. In this Report and Order, the Commission adopts a Table of Allotments for digital television (DTV),¹ rules for initial DTV allotments, procedures for assigning DTV frequencies,² and plans for spectrum recovery. The new DTV Table accommodates all eligible existing broadcasters, replicates existing service areas, and ensures sound and efficient spectrum management. The Table will also provide for early recovery of 60 MHz of spectrum (channels 60-69) and recovery of an additional 78 MHz of spectrum at the end of the transition period, for a total recovery of 138 MHz of spectrum. As we stated in the Sixth Further Notice of Proposed Rule Making (Sixth Further Notice) that we issued last July, our overarching goals in this phase of the proceeding are to ensure that the spectrum is used efficiently and effectively through reliance on market forces and to ensure that the introduction of digital TV fully serves the public interest.³

II. BACKGROUND

2. The Commission first addressed proposals relating to the development of channel allotments for DTV service the 1992 Second Further Notice of Proposed Rule Making (Second Further Notice) in this proceeding.⁴ In that action, the Commission presented proposals for the policies, procedures and technical criteria to be used in allotting and assigning channels for DTV service. Included in that action was a sample DTV Table of Allotments.

3. On July 25, 1996, we adopted the Sixth Further Notice in this proceeding to revisit our earlier proposals and to respond to technical and system developments with regard to digital broadcast television technology. In the Sixth Further Notice, we proposed policies for developing the initial DTV allotments, procedures for assigning DTV frequencies, and plans for spectrum recovery. We also proposed technical criteria for the allotment of additional

¹ Digital TV refers to any technology that uses digital techniques to provide advanced television services such as high definition TV (HDTV), multiple standard definition TV (SDTV) and other advanced features and services.

² As used herein, the terms "frequency" or "channel" generally refers to the 6 MHz spectrum block currently used to provide a single NTSC television service or to the equivalent 6 MHz spectrum block to be used for DTV services. In each case, the NTSC and DTV channel numbers used herein correspond to the same frequency bands. For example, NTSC channel 2 and DTV channel 2 both correspond to the frequency band 54-60 MHz. It should be noted, however, that whereas an NTSC frequency or channel is used to provide a single television program service, digital technology permits DTV frequencies or channels to be used to provide a wide variety of services, such as HDTV, multiple SDTV programs, audio, data and other types of communications.

³ See Sixth Further Notice of Proposed Rule Making, MM Docket No. 87-268, 11 FCC Rcd 10968 (1996).

⁴ See Second Further Notice of Proposed Rule Making, MM Docket No. 87-268, 7 FCC Rcd 5376 (1992).

DTV frequencies and provided a draft DTV Table of Allotments. This draft Table was based on the principles of full accommodation for all eligible existing broadcasters, replication of existing broadcast service areas, and sound spectrum management, and used the technical and interference characteristics of the ATSC DTV Standard. We also proposed procedures by which broadcasters in a community could request alternative allotments in their market, both before and after adoption of a DTV Table. Our proposals in the Sixth Further Notice were based on the assumptions that 6 MHz DTV channels will be assigned to existing broadcasters, and that there will be a transition period after which broadcasters will return one of their two 6 MHz channels.⁵

4. In the Sixth Further Notice, we also observed that given the efficiencies of the DTV technology it is possible to reduce the amount of spectrum currently allocated for television broadcasting without reducing the number broadcast television stations. We indicated that this approach may permit the eventual recovery of 138 MHz of spectrum at the end of the transition period.⁶ We also indicated that it may be possible to recover 60 MHz of this spectrum almost immediately from the band 746-806 MHz, *i.e.*, UHF channels 60-69, while protecting the relatively few full-service analog and digital broadcast stations in that spectrum. The draft Table included in the Sixth Further Notice therefore attempted to minimize the number of DTV channels that would be located on channels 60-69. We also indicated that if we decide to recover channels 60-69 early, we would initiate a separate proceeding to decide how this spectrum should be used.

5. We also requested comment on an alternative spectrum allotment/assignment plan for DTV service suggested by the Association of Maximum Service Television, Inc. (MSTV), on behalf of parties within the broadcast industry.⁷ This filing also included a preliminary DTV Table of Allotments and Assignments. Under this alternative approach, each broadcaster would be provided with a 6 MHz DTV channel without preference to any specific channels. Since all channels would be available, such an approach could theoretically provide for some degree of improved service area replication and interference performance. On the other hand, this option would place more DTV stations on channels that are less desirable for broadcast operations and would make spectrum recovery more difficult. We requested comment with regard to these two options.

6. In the Sixth Further Notice, we stated that in order to provide DTV allotments for

⁵ The appropriate duration of a transition period from NTSC to DTV service was not a subject of the Sixth Further Notice. That issue is being addressed in the Fifth Report and Order in this proceeding, which we are adopting today concurrent with this action. See Fifth Report and Order in MM Docket no. 87-268, adopted April 3, 1997, FCC 97-116.

⁶ See Sixth Further Notice, at para. 25-26.

⁷ See "Broadcasters' Proposed ATV Allotment/Assignment Approach," submitted by MSTV in this proceeding on January 13, 1995.

existing full service stations, it likely will be necessary that we require a significant number of low power TV (LPTV) stations and TV translator stations to make changes in their operation, including the possibility of ceasing operation.⁸ In this regard, we proposed to continue the secondary status of LPTV and TV translator stations. At the same time, we also recognized the benefits that low power stations provide to the public and therefore stated that we would seek to minimize the impact of DTV on LPTV and TV translator operations. We proposed a number of technical and administrative measures to mitigate the impact on low power stations and also requested additional suggestions for reducing the impact on low power stations. In addition, we noted that our rules currently provide for sharing of frequencies between television and land mobile service in a number of urban areas, the Gulf of Mexico offshore region and Hawaii. We therefore proposed minimum spacing criteria between DTV and land mobile operations in these areas. We also observed that our existing border agreements with Canada preclude activation of land mobile stations on existing land mobile channels 15 and 16 in Detroit and channels 14 and 15 in Cleveland and therefore proposed to make these channels available for DTV service in those markets. Finally, we requested comment and suggestions regarding conditions that should be applied in congested areas where the proposed DTV-land mobile spacing criteria cannot be met.

7. More than 450 parties representing the interests of full service television stations, low power television (LPTV) and TV translator stations, the viewing public, land mobile interests, including members of the public safety community, and equipment manufacturers submitted comments and/or reply comments in response to the Sixth Further Notice.⁹ These parties expressed a wide range of views and positions with regard to our various proposals. In addition, as part of their comments, the Joint Broadcasters submitted two alternative DTV Tables.¹⁰ One of these is a "Modified Table" that the Joint Broadcasters submit improves on

⁸ Our statement that it will be necessary to displace some LPTV and TV translator stations was based on our determinations in previous actions in this proceeding. See Second Report and Order/Further Notice of Proposed Rule Making (Second Report/Further Notice) 7 FCC Rcd 3340 (1992) at paras. 39-45; and Second Further Notice, at para. 41.

⁹ The parties submitting comments and reply comments are listed in Appendix A.

¹⁰ The Joint Broadcasters indicate that their comments express the views of a large number broadcast television stations and networks, including the five major networks (ABC, CBS, FOX, NBC, and PBS) and four trade associations (MSTV, NAB, ALTV and AAPTS). Joint Broadcasters' comments, p. 1. The Joint Broadcasters state that while their comments represent the consensus of their signatories on allotment/assignment principles, some of these parties may differ on some points and some may file separate comments to address specific DTV allotments and other issues. Their filing indicates that AAPTS and PBS (as well as those public TV stations whose names do not appear separately on the list of parties participating the Joint Broadcasters' filing) endorse the policy arguments in the joint comments, but do not endorse adoption of the Modified Table. These parties believe that adjustments beyond individual channel and facility changes to the Modified Table are needed to protect public television station's interests, particularly the incorporation of minimum power levels. Fox takes exception to the Joint Comments on certain issues. It supports fewer low VHF allotments during the transition, the use of a 10 dB noise figure exclusively for all bands in developing the Table, relaxation of the exact co-location requirement for adjacent channel assignments in special cases, and certain changes to the

the draft Table by modifying its technical assumptions and making increased use of channels 2-6 and 52-69. They state that their Modified Table would reduce interference to NTSC and DTV service, increase service replication, reduce displacement of low power TV stations and increase flexibility for stations to make channel and station adjustments over time. The other table is a "Baseline Table" that the Joint Broadcasters state revises the draft Table to reflect technical concerns relating to planning factors, use of adjacent channels, use of channels 3 and 4 in the same market, allotments in the Canadian and Mexican border areas, and corrections to the engineering data base used to develop the DTV Table. Motorola also submitted, as part of its comments, an alternative Table that reflects its efforts to enhance the opportunity for early recovery of channels 60-69.¹¹ Motorola also states that the Joint Broadcasters' Modified Table greatly reduces the usefulness of early recovery of channels 60-69 without improving the spectrum environment for broadcasters. It submits that the Modified Table provides insignificant improvements as compared to either the FCC's draft Table or its own Table.¹²

III. ALLOTMENT AND ASSIGNMENT PRINCIPLES

A. Full Accommodation

8. In the Sixth Further Notice, we proposed that our primary allotment objective be to accommodate all eligible existing broadcasters with a channel for DTV service. We also stated that, subject to any changes resulting from our Fourth Further Notice, parties eligible for a DTV channel will be the following: a) all full-service television broadcast station licensees; b) permittees authorized as of October 24, 1991; and c) all parties with applications for a construction permit on file as of October 24, 1991, who are ultimately awarded full-service broadcast station licenses.¹³ We also noted that we would follow the criteria for initial eligibility provided by the Telecommunications Act of 1996 (Telecom Act).¹⁴ We

Modified Table. Joint Broadcasters' comments, p. 2, footnote 2. Fox filed separate comments on these issues.

¹¹ Motorola comments, p. 9.

¹² Motorola reply comments, p. 8.

¹³ We addressed the issue of eligibility for initial DTV channels in the Fourth Further Notice of Proposed Rule Making and Third Notice of Inquiry (Fourth Further Notice), MM Docket No. 87-268, 10 FCC 10541 (1995). Therein, we maintained our earlier proposal, in the Second Further Notice, to limit eligibility for DTV channels to broadcasters that meet the above criteria. See Fourth Further Notice, at paras. 27-32; see also Second Further Notice, at para. 9.

¹⁴ In the Sixth Further Notice, we noted that Section 201 of the Telecommunications Act of 1996 (Telecom Act) amends the Communications Act to add a new Section 336 which provides, inter alia, that "[i]f the Commission determines to issue additional licenses for advanced television services, the Commission ... should limit the initial eligibility for such licenses to persons that, as of the date of such issuance, are licensed to

indicated that we believed that we would, in fact, be able to accommodate all eligible broadcasters with a temporary channel for DTV service. In the event that a shortage of allotments might occur, however, we proposed to rank eligible parties in the following order: 1) licensees and permittees with constructed facilities having program test authority; 2) other permittees; and 3) all parties with an application for a construction permit pending as of October 24, 1991.¹⁵ In the Fifth Report and Order in this proceeding, we adopted eligibility criteria that conform with the guidance set forth in Section 201 of the 1996 Telecommunications Act.¹⁶ We therefore limited the initial eligibility for DTV licenses to "persons that, as of the date of such issuance, are licensed to operate a television broadcast station or hold a permit to construct such a station or both."

9. Comments. The commenting parties generally support our proposal to provide an allotment in the initial DTV Table for all eligible broadcasters. For example, the Joint Broadcasters submit that full accommodation is important to achieving the goal of implementing DTV service without disrupting the public's free over-the-air television service. They also state that full accommodation will ensure that full service broadcasters are able to provide the new digital TV service and so preserve and improve the nation's broadcast service. The Joint Broadcasters note that full accommodation has been the foundation of their filings in this proceeding since 1987.¹⁷ On the other hand, Abundant Life Broadcasting (ALB), a LPTV licensee, argues that we should consider awarding temporary second channels to fewer than all full service TV licensees.¹⁸ ALB is concerned that our full accommodation proposal would result in the displacement of LPTV stations. It questions whether the public interest requires all stations to have DTV allotments in markets where there are more than 5 or 6 full service stations.

10. A number of parties suggest modifications to our proposed eligibility criteria. For example, the Association of America's Public Television Stations (AAPTS), in its separate comments, states that we should review the applications for NTSC channels that were filed between the DTV eligibility cut-off date and the NTSC application cut-off date and determine

operate a television broadcast station or hold a permit to construct such a station." Telecommunications Act of 1996, Pub. L. No. 104-1-4, Section 201, 110 Stat. 56 (1996), and 47 U.S.C. § 336(a).

¹⁵ This ranking proposal was previously presented in the Memorandum Opinion and Order/Third Report and Order/Third Further Notice of Proposed Rule Making in this proceeding, (Third Report/Further Notice), MM Docket No. 87-268, 7 FCC Rcd 6924 (1992), at paragraph 10. In the Fourth Further Notice, we also indicated that in the event that we were not able to accommodate all eligible existing broadcasters with an DTV channel, there are other options to allow broadcasters to participate in DTV service, such as switching directly to DTV service at some point during or at the end of the transition period. See Fourth Further Notice, at footnote 24.

¹⁶ See Fifth Report and Order, at Section III.B.

¹⁷ Joint Broadcasters' comments, pp. 4 and 11-12.

¹⁸ ALB comments, pp. 2-3.

whether it is possible to pair DTV channels with any of those NTSC channels.¹⁹ Several parties, such as Davis Television Topeka, LLC, et al., Innovative Television, Inc., and Las Tres Palmas Corporation request that we provide a DTV allotment to applicants for construction permits (CPs) for new stations.²⁰ Cordon and Kelly argues that we should substitute DTV allotments for the analog NTSC channels applied for by its clients.²¹ Also, Gwendolyn A. Christopher is concerned that if we limit DTV frequencies to only full service stations, we would impose an impediment to the "truly" small telecommunications businesses like LPTV, contrary to the diversity goals of Section 257 of the 1996 Telecommunications Act.²²

11. Decision. We continue to believe that our primary allotment objective should be to develop a DTV Table that provides a channel for all eligible broadcasters. This approach will promote an orderly transition to the new service by ensuring that all eligible full service broadcasters are able to provide digital service. Our decision to accommodate all eligible broadcasters is also consistent with the provisions of the 1996 Telecommunications Act regarding initial eligibility for DTV licenses. We disagree with those parties that suggest we provide allotments for fewer than all full service licensees in order to avoid the displacement of low power TV stations. We note that low power television and TV translator operations are authorized only on a secondary basis. We have consistently maintained this approach towards low power service. Our decisions with regard to this issue have, in fact, been upheld on judicial review in Polar Broadcasting v. F.C.C.²³ However, because we recognize the benefits low power stations provide to the public, we are also implementing a number of measures to mitigate the impact of DTV implementation on low power stations, so that the great majority of these operations should be able to continue to operate. Accordingly, the DTV Table of Allotments adopted herein provides an allotment for all eligible broadcasters, as defined above. We have considered and addressed the comments concerning eligibility for a DTV allotment in our decision on DTV eligibility in the Fifth Report and Order, supra.

B. Digital TV Service Areas

12. In the Sixth Further Notice, we proposed to allot DTV channels using a "service replication/maximization" concept suggested by a variety of broadcast industry interests and

¹⁹ AAPTS comments, p. 29-30.

²⁰ Davis comments, p. 2; Innovative comments, p. 1; Las Tres Palmas comments, pp. 2-3.

²¹ Cordon and Kelly comments, pp. 2-3.

²² Section 101 of the Telecom Act amended the Communications Act of 1934 to add a new section 257. See Section 101 of the Telecommunications Act of 1996, supra, and 47 U.S.C. § 257. Christopher comments, pp. 3-4.

²³ See Polar Broadcasting v. F.C.C., 22 F.3d 1184 (D.C. Cir. 1994) (table).

representatives.²⁴ Under this approach, we would attempt to identify digital TV allotments that, to the extent possible, will allow all existing broadcasters to provide DTV service to a geographic area that is comparable to their existing NTSC service area.²⁵ Consistent with the comparable coverage objective, we would use the service replication approach to match DTV frequencies with existing NTSC frequencies to create channel pairings/assignments. The goal of this approach would be two-fold: 1) to provide DTV coverage comparable to a station's current coverage area and, 2) to provide the best correspondence between the size and shape of the proposed DTV channel's coverage area and the station's existing coverage. In this regard, we also proposed to specify for each DTV allotment a maximum permissible effective radiated power (ERP) and antenna height above average terrain (HAAT) that would, to the extent possible, provide for replication of the station's existing service area. Furthermore, we proposed to allow stations to maximize or increase their service area, in accordance with our proposed limits on maximum allowable station facilities, where such an increase would not create additional interference.²⁶ We also requested comment on whether we should specify a minimum ERP for full service DTV stations in the same manner as we specify for NTSC stations in Section 73.614. We further requested comment on whether it might be more desirable instead to allot DTV channels using an approach that maximizes the service areas of all DTV stations.²⁷ This approach would tend to equalize the coverage areas of all stations within a market and reduce the current disparities among stations.

13. In the draft DTV Table included with the Sixth Further Notice, we proposed to specify an effective radiated power (ERP) and an antenna height above average terrain (HAAT) for each DTV allotment.²⁸ The values of these parameters for each station were chosen so as to describe initial DTV allotments that would allow existing broadcasters to provide DTV service to a geographic area that replicates, to the extent feasible, the service area of their existing NTSC station. The antenna HAAT specified for each DTV allotment was the same as antenna HAAT of its associated NTSC station. The ERP for each allotment

²⁴ For example, this approach was suggested by the Commission's Advisory Committee on Advanced Television Service (Advisory Committee), the Broadcast Caucus, the Association of Maximum Service Television, Inc. (MSTV), the National Association of Broadcasters (NAB) and others.

²⁵ The methodology used to calculate NTSC service area is based on studies and methodologies developed by industry and our Advisory Committee. This methodology is described below in the discussion of our DTV allotment methodology. See Final Report and Recommendation of the Advisory Committee on Advanced Television Service, November 28, 1995.

²⁶ Under this proposal, stations would be permitted to increase their power and antenna height up to that permitted for maximum facilities, as discussed below.

²⁷ The Commission earlier had proposed to adopt the service area maximization approach in the Second Further Notice of Proposed Rule Making in this proceeding. See Second Further Notice of Proposed Rule Making in MM Docket No. 87-268, 7 FCC Rcd 5376, at paras. 11-16.

²⁸ See Sixth Further Notice, Appendix B.

was then calculated to provide service area replication up to a maximum ERP of 5 megawatts. We also proposed in the draft DTV Table the following minimum values for ERP: 1 kW for lower VHF channels, 3.2 kW for upper VHF channels, and 50 kW for UHF channels. This would allow smaller stations, if they desire, the ability to expand their existing coverage as they transition to DTV.

14. Comments. Many of the commenting parties that address this issue support the basic service replication concept.²⁹ These parties agree with our tentative conclusion that this approach would foster the transition to DTV, while simultaneously preserving viewers' access to off-the-air TV service and the ability of stations to reach the audiences they now serve. The Joint Broadcasters submit that the first priority in allotting DTV channels should be to replicate service areas of all stations to the maximum degree possible, in order to avoid disenfranchising viewers. They further state that maximization of service areas should be a secondary goal. The Joint Broadcasters submit that smaller stations should have the opportunity to expand their service areas up to the largest station in the market so long as they do not cause interference to neighboring stations. They believe that this ordering of priorities is the most efficient and equitable way of achieving a seamless transition that best fulfills viewers' expectations while recognizing broadcasters' investment in their core business.³⁰ Joint Broadcasters state that pairing of DTV and NTSC channels should be on the basis of coverage and interference characteristics, with no attempt to enlarge DTV coverage at the expense of NTSC service.³¹

15. APTS, IBC, Malrite Communications Group, Inc. (Malrite), Silver King Communications, Inc. (Silver King), and Univision Communications, Inc. (UCI) state that the service replication principle should be coupled with a maximization principle.³² These parties generally submit that both during and after the transition, every DTV licensee should be permitted to expand its digital service area up to the maximum service area it could attain with the maximum height and power allowed for its NTSC facilities, provided the increase would not cause interference to another station. UCI states that allowing such modifications would not only allow licensees to provide greater levels of service to a larger portion of the public, but would also enable stations to individually address any as yet unknown propagation peculiarities of the DTV signal.³³ APTS also states that it may be impractical in some

²⁹ Parties supporting this approach include the Joint Broadcasters, the Electronic Industries Association and the EIA Advanced Television Committee, in joint comments (EIA), the Independent Broadcasting Company (IBC), KUPN-TV, the Southeastern Ohio Television System (SOTS), Univision Communications, Inc. (UCI), and others.

³⁰ Joint Broadcasters' comments, p. 5.

³¹ Joint Broadcasters' comments, p. 11.

³² APTS comments, pp. 8-9; IBC comments, p. 2;

³³ UCI comments, p. 9.

instances due to costs considerations for some stations, including noncommercial stations, to build DTV facilities with the maximum height and power specified in the DTV Table. As an alternative, it suggests that stations be permitted to use boosters or translators to serve any portion of their DTV coverage areas that could be served with maximum facilities.³⁴

16. A number of parties representing broadcast engineers and broadcast stations currently operating on UHF channels express concern with regard to the approach used for specification of DTV power levels in the draft Table.³⁵ These parties observe that in attempting to replicate the service areas of existing VHF stations whose DTV operations would be on UHF channels, the draft Table specifies differences in ERP levels between UHF DTV channels in many markets are much greater than for current UHF service.³⁶ For example, SHBC notes that the power levels specified for many UHF DTV allotments that replicate the service areas of UHF NTSC stations are only 50 kW, while the power levels for UHF DTV channels that replicate the service of VHF NTSC stations are often several megawatts. These parties generally argue that these power differences would increase the existing disparities between UHF and VHF stations. KSCI-TV also submits that the very high power levels specified in the draft Table would lead to interference with NTSC and other DTV stations.³⁷ SHBC states that more review is needed to determine if the high UHF power levels listed on the draft Table are actually needed and if the lower power levels listed for many stations will achieve realistic performance.³⁸

17. AFCCE, KSCI-TV, and Pappas Telecasting Companies (Pappas) further argue that the very high ERP levels specified for many stations are impractical.³⁹ For example, AFCCE notes that the draft Table proposes to allow some DTV UHF stations to operate with as much as 5 MW average power, and that this would require a transmitter that could operate at a peak power of 20 MW or more. It states that, based on consultations with several major television transmitter manufacturers, this is nearly four times larger than the largest UHF-TV transmitters being manufactured today and would not be practical given the limitations of

³⁴ APTS comments, pp. 8-9.

³⁵ Parties expressing concern with regard to the approach used to specify power levels for DTV allotments include the Association of Federal Communications Consulting Engineers (AFCCE), du Treil, Lundin and Rackley (DLR), Fireweed Communications Corporation (Fireweed), Holston Valley Broadcasting (HVB), Kentuckiana Broadcasting, Inc. (Kentuckiana), KSCI-TV, LeSEA Broadcasting, Inc. (LeSEA), the Los Angeles Broadcasters for a Common Transmitter Site (LABCTS), the TV Chief Engineers (TCE), Scripps Howard Broadcasting Company (SHBC) and Sunbelt Communications Company (Sunbelt).

³⁶ AFCCE comments, pp. 5-6; DLR comments, pp. 2-3; HVB comments; p. 5; SHBC comments, pp. 2-3.

³⁷ KSCI-TV comments, p. 1.

³⁸ SHBC comments, p. 2-3.

³⁹ AFCCE comments, p. 4; KSCI-TV, comments, pp. 1-2; Pappas comments, p. 10.

existing TV transmitter technology. AFCCE and the California Department of General Services (CDGS) also submit that the very high power levels and co-location of transmitters could lead to problems for stations in meeting the RF exposure regulations.⁴⁰

18. Some of these parties suggest alternative approaches for replicating the service areas of VHF stations on UHF DTV channels. In particular, AFCCE submits that a more reasonable approach to the allotment process would be to define a grade of service within or to the radio horizon (about 45 miles) and a second grade of service beyond the radio horizon based on a different set of planning factors.⁴¹ Under this plan, the principal difference between the two grades of service would be the assumption that receivers (antennas) located beyond the radio horizon would employ a low noise amplifier (LNA) to overcome the significant penalties associated with distance and over-the-horizon propagation and achieve the same degree of replication as now proposed. The actual power authorized for a DTV station would be the higher of: 1) the power needed to provide the specified field strength at the radio horizon using the Longley-Rice F(50,90) model without an LNA assumption, or 2) the power needed to replicate the station's existing NTSC Grade B contour with the specified field strength based on Longley Rice F(50,90), capped at a maximum of 500 kW (for UHF), assuming the use of an LNA.

19. KSCI-TV and the LABCTS recommend that DTV power be limited to that needed to provide a quality signal to an area limited by the radio horizon.⁴² They state that during the transition, all DTV stations in a market should be authorized the same ERP value, adjusted for free air attenuation of the higher frequencies. The TCE states that the most equitable approach to maximization of service would be to uniformly increase the percentage of service area for all stations up to the point where interference is caused to signals from neighboring cities.⁴³ They therefore recommend that we abandon the replication/maximization paradigm in lieu a 107 km Grade B radius model. DLR suggests a plan under which each eligible station would be assigned a second channel for DTV use during the transition and each station would be authorized transmitting facilities for its proposed DTV channel based on the station's current Grade A contour.⁴⁴ After the transition, stations would return to their existing NTSC channel for final DTV operation and ultimate replication of their existing NTSC coverage. Fireweed submits that the power required for DTV operation should not be greater than is currently required for NTSC service. It submits that VHF stations should be permitted to operate small temporary DTV stations on UHF channels and then convert back

⁴⁰ AFCCE comments, p. 5; CDGS comments, p. 3.

⁴¹ AFCCE comments, p. 6.

⁴² KSCI-TV comments, p. 2; LABCTS comments, p. 2.

⁴³ TCE comments, p. 2.

⁴⁴ DLR comments, pp. 2 and 4.

to their original channels. Citadel Communications Corporation, Ltd. (Citadel) suggests a similar approach.⁴⁵

20. Other parties, such as HVB and Pappas, state that more moderate power levels of perhaps 1000 kW would achieve about the same coverage at reasonable capital and operational costs. HVB also submits that lower power levels would eliminate the large areas of interference that would be caused by stations operating at higher power.⁴⁶ Pappas states that this maximum power limit, with an antenna height of 2000 feet, would reduce crowding in the DTV Table and make it easier to accommodate the proposed 50 kW minimum power standard.⁴⁷ Media General, Inc, and Park Acquisitions, Inc. (Media General/Park) and Pappas states that in order to minimize interference and best serve the public during the transition, it may be better to start with reduced DTV power, such as a 500 kW maximum for UHF.⁴⁸ Media General/Park submits that this lower level would be appropriate until additional information is available on appropriate power levels.

21. APTS, Maranatha Broadcasting Company (Maranatha), Pappas, and Rural support our proposal to provide a minimum of 50 kW for UHF DTV operations.⁴⁹ APTS submits that the establishment of minimum power levels would permit existing stations with very small service areas to replicate their existing coverage, and also will improve their coverage to some extent. APTS states that this would narrow the coverage gap between stronger and weaker stations and ameliorate the VHF/UHF disparity. Pappas submits that the strict replication plan submitted by the Joint Broadcasters, with power levels less than 50 watts for many stations, would impede the ability of a large number of UHF stations to serve the public adequately. Pappas states that many UHF stations have not constructed their maximum facilities, and that the principle reason for this is that until very recently, high-power UHF broadcast equipment capable of operating with sufficient efficiency to justify its installation in many small markets was simply not available. It submits that by potentially freezing the DTV allotments for such stations into limited coverage operations, the Joint Broadcasters' plan would thwart those broadcasters' efforts to provide programming to a greater number of viewers. Pappas also argues that the Joint Broadcasters' plan will negatively impact emerging networks. It states that most stations affiliated with these networks are UHF stations and that by failing to provide UHF stations with at least minimally adequate levels of power, the Joint Broadcasters' plan would harm the viability and

⁴⁵ Citadel comments, pp. 5-6.

⁴⁶ HVB comments, pp. 5-8.

⁴⁷ Pappas comments, pp. 21-22.

⁴⁸ Media General/Park comments, p. 4; Pappas comments, p. 4.

⁴⁹ APTS comments, pp. 6-7; Maranatha comments, p. 4; Pappas comments, pp. 18-20; Rural comments, p. 2.

development of those networks. Rural is concerned that because of the limited amount of spectrum available for DTV, the ERP values adopted with a DTV Table will serve as a ceiling on station growth. It states that minimum power levels would ensure that small stations are treated fairly.

22. In its reply comments, the Broadcasters Caucus (Caucus) acknowledges the concerns expressed by other broadcasters with regard to the power levels proposed for DTV operation.⁵⁰ It agrees that if the relative close-in and indoor antenna reception coverage of NTSC VHF channels moving to DTV UHF channels (V's-to-U's) would be better than that of NTSC UHF channels moving to DTV UHF channels (U's-to-U's), the relative competitive posture of analog VHF and UHF stations would not be replicated in the DTV environment. The Caucus submits that after many discussions, members of the broadcasting industry have greatly narrowed the gap on this issue and have nearly mapped out an interim plan to manage the uncertainties over the first several years of the DTV roll-out, until more definitive field data is available. Based on these discussions, it suggests a plan, which it states is supported by representatives of the U-to-U community within and outside of the Caucus, under which: 1) industry would commit to field and other research to study the extent to which the relative competitive posture of existing UHF and VHF stations is replicated with respect to Grade A and Grade B coverage and taking into account indoor direct connected antennas and reliability of reception, 2) the Commission would proceed with the Joint Broadcasters' allotment/assignment approach and include in this decision language recognizing the objectives and issues to be addressed in the field tests. It further recommends that we adopt a five-step plan for addressing the DTV power issue.⁵¹

- 1) Allow stations to improve their indoor antenna reception by increasing their overall power beyond the power levels specified in the DTV Table and target such power within their current Grade A service area, provided no interference is caused to other stations operating on the same or first adjacent channel.
- 2) Implement the principle of service maximization. The Caucus states that this would allow at least 700 of the existing UHF stations to increase their power. It also states, however, that most stations in major markets may not be able to take advantage of the maximization principle.
- 3) Allow U-to-U stations in any given market to double their power, not to exceed two-thirds of the power level of the lowest V-to-U in the same market or level "X," from that specified in the Modified Table for the initial two-year period that begins with the adoption of the DTV Table, provided that no new material interference is caused to NTSC stations. At the end of two years, we would determine, taking into account the field data to be developed by the broadcast industry and interference concerns, whether and how to adjust the U-to-U power

⁵⁰ Broadcasters Caucus reply comments, pp. 13-16.

⁵¹ Id., pp. 13-16.

levels in the future so as to replicate in the DTV environment the relative competitive posture of U-to-U and V-to-U stations. The Caucus states that this proposal would be premised on our adoption of the 7 dB receiver noise figure planning factor proposed by the Joint Broadcasters.

- 4) Implement a phased-in approach to power for all DTV stations for a two-year period from the adoption of the DTV Table. Under this provision, DTV stations would be licensed at the powers specified on the Modified Table, but would operate at no more than level "X" for this two-year period (unless operating under the conditions specified in the next step). During this first two-year phase, all stations would have protected service areas out to their replicated coverage area. In order to enable the collection of field data, a certain number of V-to-U stations participating in the testing process would be permitted to operate at more than level "X," up to the levels specified in the Modified Table.
- 5) Recognize the importance of finding solutions to the problem of any failure to replicate the relative competitive posture of analog VHF and UHF stations in the new DTV environment and consider the recommendations of the organizations conducting research on this matter. It states that should the field tests show that fixes are necessary, we should adopt appropriate solutions, including power increases or decreases for DTV stations as necessary, individual DTV station facility changes and the assignment of unassigned channels if available.

The Caucus states that broadcasters could not achieve a consensus on the "X" level of power, and that they reached a stalemate at a difference of 3 dB. It indicates that some organizations, including ABC, CBS, NBC and MSTV, proposed a 1000 kW level and others, including ALTV, AAPTS/PBS, Sinclair, Tribune and Viacom, proposed a 500 kW level.⁵²

23. The Joint Broadcasters argue that rather than establish minimum power levels, we should adopt minimum DTV service areas that use a combination of power and tower height parameters to achieve the minimum service contours.⁵³ They state that such minimum service areas should be determined after more study and should assure all stations of a reasonable service area without impinging on the ability of all stations to at least replicate their NTSC service. In its reply comments, the Broadcasters Caucus further states that we should incorporate a minimum DTV service area of 65 km (40 miles) into the DTV Table. It states that this proposal would allow 14% of existing stations (primarily in the UHF band) to increase their service areas. The Caucus also submits that the interference that would result from a 65 km minimum service area would be minimal.⁵⁴

24. A number of parties, including the Joint Broadcasters, KUPN-TV, Costa del Oro,

⁵² Id., p. 13.

⁵³ Joint Broadcasters comments, pp. 44-45.

⁵⁴ Broadcasters Caucus reply comments, pp. 16-17.

Inc. (Costa), UCI and others, express concern that if we base service replication on the May 13, 1996, data base we used in preparing the draft Table, stations that received an authorization to modify their technical facilities (power, antenna height, and/or location) after that date would receive a DTV allotment that only represents their former facilities.⁵⁵ These parties submit that the DTV allotment for a station whose application for modification was granted after May 13, 1996, should be based on replication of the station's new service area. For example, KUPN-TV states that this change would ensure that stations making a good faith effort to improve their Grade B service would not be hampered in their transition to DTV.⁵⁶ Some of these parties argue that using the May 13, 1996, data base would be particularly unfair to stations that filed their application for modification before the date of adoption of the Sixth Further Notice.⁵⁷ In this regard, UCI states that if we use the May 13, 1996, data base as the standard against which service replication will be measured, it will not receive digital replication capability for any of the NTSC contours for which it has applied since 1994, even though the applications for the changes to achieve these new contours were filed prior to the adoption of the Sixth Further Notice.⁵⁸ Costa argues that there is no reason why viewers should suffer NTSC or DTV service losses due to the selection of a cut-off date after a station has filed an application for facilities change.⁵⁹ These parties submit that at a minimum we should include grants of applications for facility changes that were filed prior to the Sixth Further Notice in the data base used to determine existing service areas.

25. A number of broadcasters disagree with our proposal to base DTV service areas on replication of the service areas of existing stations.⁶⁰ These parties, who represent primarily the interests of existing UHF stations, generally express concern that the service replication plan would perpetuate the existing competitive disparities between UHF and VHF

⁵⁵ These parties include Costa, Crossville TV Limited Partnership (Crossville), Grant Communications Group (Grant), Hutchens Communications, Inc. (Hutchens), the Joint Broadcasters, KUPN-TV, Lin Television Corporation, et al. (The Modifiers), Media Venture Management, Inc. (MVM), Second Generation of Iowa, Ltd. (Second Generation), Silver King, Sonshine Family TV Corporation (Sonshine), UCI, Valley Channel 48, Inc. (Valley), and VCY America.

⁵⁶ KUPN comments, p. 1.

⁵⁷ Parties that support basing replication on a station's new service area if the application for modification was filed before adoption of the Sixth Further Notice include Grant, the Joint Broadcasters, KUPN-TV, the Modifiers, Sonshine Family TV Corporation (Sonshine), UCI, and VCY America.

⁵⁸ UCI comments, p. 4.

⁵⁹ Costa comments, p. 3.

⁶⁰ Parties opposing the service replication plan include BET Holdings (BET), Blade Communications, Inc. (Blade), Cannell Cleveland, L.P. (Cannell), DeSoto Broadcasting, Inc. (DeSoto), Grant Broadcasting Group (Grant), KLGT-TV, LeSea, Lewis Broadcasting (Lewis), Sunbelt Communications Company (Sunbelt), TV-52, Inc. (TV-52), Wabash Valley Broadcasting Corporation (Wabash), the Western New York Public Broadcasting Association, and WLEX-TV and Word Broad Broadcasting Network (WBN).

stations. For example, Blade, DeSoto and Grant submit that limiting DTV coverage to an area comparable to a station's existing NTSC coverage would prolong inequities that result from the more favorable propagation characteristics of VHF signals compared to UHF signals.⁶¹ In statements generally representative of this group, Grant argues that with the implementation of DTV service, we have the opportunity to remove these inequities. It states that such action would serve not only UHF broadcasters, but also the public interest in that it would result in a wider variety of free television choices for viewers. DeSoto and WBN are concerned that the strategy of allotting first and maximizing later would provide no guarantee, or reasonable expectation, that a station will be able to maximize its service area.⁶² BET also submits that if we equalize service areas, new entrants that acquire spectrum through acquisition will be able to more effectively enter the DTV market.⁶³

26. Most of the broadcasters opposing the service replication approach ask that we ensure that stations in a market have comparable technical facilities. For example, Cannell argues that all UHF stations in a market should be allowed the same maximum power, so long as this would not result in interference. Grant and DeSoto submit that if we decide to base DTV service areas on service replication, then we should build in flexibility to permit stations with smaller service areas to maximize their coverage once the transition to and development of DTV is completed.⁶⁴ Aries Telecommunications Corporation (Aries), Lewis, and TV-52 support our earlier proposal to maximize the service areas of all DTV stations as a means to resolve the current disparities between stations, particularly with respect to the inequalities that currently exist between VHF and UHF stations.⁶⁵ Aries and Lewis also state that broadcasters would be motivated to construct DTV facilities if they perceive an opportunity to improve an inferior market position.

27. The Community Broadcasters Association (CBA) argues that we should not attempt to replicate the full service areas of existing stations.⁶⁶ It is concerned that replication of stations' existing service areas would result in greater impact on LPTV and TV translator stations. CBA observes that accommodating both full power and low power television will be most difficult during the transition, when the demand for broadcast spectrum will be highest. It therefore recommends an alternative approach under which the second channels would only replicate stations' existing Grade A contours. CBA submits that replication of a station's

⁶¹ Blade comments, p. 4; DeSoto comments, p. 2; Grant comments, p. 3.

⁶² DeSoto comments, p. 3.

⁶³ BET comments, p. 10.

⁶⁴ DeSoto comments, p. 3; Grant comments, p. 3.

⁶⁵ Aries comments, p. 2; Lewis comments, p. 3; TV-52 comments, p. 2.

⁶⁶ CBA comments, p. 8.

Grade A contour would provide service to all or nearly all of the viewers in the its market area. Under CBA's approach, the second channels would be "loaner" channels for interim DTV operations; stations would revert back to their existing channels at the end of the transition, when it should be easier to accommodate both full power and low power stations.

28. The Joint Broadcasters, on the other hand, continue to oppose the Commission's earlier proposal to allot DTV channels using an approach that maximizes the service areas of all DTV stations.⁶⁷ They state that such an approach would disenfranchise significant numbers of viewers of the larger NTSC stations and would actually have the effect of reducing the service areas of a majority of the nation's television stations. The Joint Broadcasters argue that these considerations would result in a disincentive for broadcasters to implement DTV service, rather than roll out service as quickly as possible.

29. Decision. We continue to believe that our service replication proposal, with some modifications, is the appropriate approach for implementation of DTV. We believe that providing DTV allotments that replicate the service areas of existing stations offers important benefits for both viewers and broadcasters. This approach will ensure that broadcasters have the ability to reach the audiences that they now serve and that viewers have access to the stations that they can now receive over-the-air. At the same time, we recognize, as pointed out by many of the commenting parties, that the service replication approach proposed by the broadcast community and presented in the Sixth Further Notice could lead to increased disparities among stations. The basic compromise plan set forth in the reply comments of APTS, the Broadcasters Caucus and others, addresses many of these concerns. We believe that many aspects of the compromise would be useful in developing a more equitable service replication approach.

30. In considering the DTV power issue, we believe that it is important to adopt an approach that provides for a high degree of service replication by all stations, while at the same time ensuring that all stations are able to provide DTV service competitively within their respective markets. We therefore believe that it is appropriate to develop the DTV Table based on a minimum power level of 50 kW and a maximum power level of 1000 kW.⁶⁸ We find that a 50 kW minimum power level will ensure that stations have a sufficient service area to compete effectively in the provision of DTV services and is consistent with the maximization concept supported by the industry. We further believe that this minimum power approach, along with maximization, will provide more opportunities for stations, in particular existing UHF stations, to provide larger DTV service areas than the minimum

⁶⁷ Joint Broadcasters comments, pp. 12-13.

⁶⁸ These minimum and maximum power levels are for allotment purposes only for DTV facilities on UHF frequencies. The minimum DTV levels for VHF facilities are: 1 kW for lower VHF channels and 3.2 kW for upper VHF channels. All power levels specified in the DTV Table are the maximum permitted ERP taking into account existing antenna patterns. Actual service and operating requirements for DTV stations are addressed in the Fifth Report and Order in this proceeding.

service area approach suggested by the Joint Broadcasters and the Broadcasters Caucus. We also expect that the results of the broadcasters' studies will show that 1000 kW is sufficient to provide a very high degree of service replication for almost all stations. Accordingly, we believe that 1000 kW is an appropriate maximum power level for use in development of the DTV Table. We also believe that the 1000 kW power limit may help to reduce the impact on low power TV stations and poses less potential for interference among full service stations. This power level will also allow us to provide a more equitable distribution of opportunities for maximization of service areas to full service DTV stations of all sizes. Furthermore, as indicated below, we are considering whether to maintain use of the lower VHF channels for DTV service. If service replication proves difficult for existing VHF stations operating on UHF channels with 1000 kW, those stations may have the option to revert to their VHF channels, if such channels prove feasible for DTV operation. In addition, if future field testing and studies show that higher power is needed to provide a satisfactory level of replication or changes in the treatment of interference are warranted, we will be able to evaluate those results at our planned two-year review and consider whether adjustments are needed.⁶⁹ In order to allow broadcasters to study this matter, we will entertain requests for a limited number of stations to experiment at power levels higher than those specified for individual allotments in the DTV Table.

31. With regard to permitting stations to maximize or increase their service areas by operating with additional power or higher antennas than specified in the DTV Table, we agree that stations should be able to maximize their facilities provided that no new interference is caused to other stations.⁷⁰ We therefore will permit stations to request an increase in their operating power and/or height of antenna from that specified in the DTV Table, up to the maximum permissible limits on DTV power and antenna height set forth below or up to that needed to provide the same geographic coverage as the largest station within their market. Such requests must be accompanied by a technical showing that the increase would not result in new interference or statements agreeing to the change from any co-channel or adjacent channel stations that might be affected.⁷¹ If such requests are approved by the Commission, the larger service area resulting from an authorized power or antenna height increase will be protected in the same manner as the initial replicated service area.

⁶⁹ See Fifth Report and Order for description of our two-year review. We note that in ex parte submissions Viacom, et alia, recommend that we consider an upward adjustment of the minimum DTV power level based on modification of permissible interference levels. See letter dated March 26, 1997, to the Honorable Reed E. Hundt, Chairman of the Federal Communications Commission.

⁷⁰ In this regard, we would entertain requests for increases in power by DTV stations above the 1000 kW level where such additional power would be required to provide service to the station's Grade B contour and would not result in additional interference. For stations with DTV power below 1000 kW, we would entertain requests for additional power to allow them to serve an area up to the Grade B contour of the largest station in the market provided that such increases in power would not result in additional interference.

⁷¹ The maximum permissible power and antenna combinations are discussed in section VII-A, below. These limits are set forth in Section 73.622(f) of the rules in Appendix E.

32. For purposes of service replication, the service or coverage area of a DTV allotment is the predicted noise-limited service area, contained within the Grade B contour of the NTSC station associated with that allotment, less any area where interference from other DTV or NTSC operations may occur.⁷² DTV service areas are calculated using the parameters specified in the DTV Table, including maximum ERP, HAAT, and the actual antenna patterns of the associated NTSC stations. This definition of service area shall also be used for purposes of determining whether a "maximization" of facilities or other type of modification causes interference to a DTV allotment.⁷³

33. With respect to comments requesting that we update the May 13, 1996, engineering data base, we concur and, as stated previously, the Table included in the Sixth Further Notice was a draft. It has always been our intention to use the most current station data available in developing the DTV Table. Accordingly, the DTV Table of Allotments adopted herein is based on a data base that is current as April 3, 1997.⁷⁴ This data base includes new station parameters corresponding to modifications of facilities granted to date, and to the extent possible, provides for replication of modified facilities that were granted on a conditional basis. As discussed in the Fifth Report and Order, broadcasters will be allowed to begin DTV operations at power levels less than those needed for achieving full service area replication. That is, broadcasters will be allowed to operate at power levels lower than those specified for their operation in the DTV Table. This will afford them an opportunity to increase their power over time and thereby "grow into" the power level needed for full service area replication, as specified in the DTV Table. We plan to review this policy two years after the adoption of this Report and Order.

⁷² The definition of the Grade B contour of an NTSC station is set forth in § 73.683 of the rules, 47 CFR § 73.683.

⁷³ Where a modification or maximization of the values for an individual allotment contained in the TV Table adopted herein is approved, the new service area resulting from such modification or maximization beyond the associated station's Grade B contour shall be protected. The new service area shall be calculated in accordance with the procedures specified in the Fifth Report and Order. This procedure shall also be used for determining the service areas of TV stations that are provided larger service areas through the minimum power level provisions in the TV Table.

⁷⁴ See Sixth Further Notice, at paras. 2 and 88.

C. Spectrum for DTV

34. In the Sixth Further Notice, we stated that the primary goal of this proceeding is to ensure that the implementation of DTV is accomplished in a manner that serves the public interest. We also stated that it is important to provide the new digital TV stations with the spectrum that is the most appropriate and technically suitable for their operation. In addition, we stated that given our obligation to manage the spectrum efficiently in the public interest and the increased number of stations that the TV spectrum can accommodate, we believe it is important that the recovery of spectrum that is not needed for DTV continue to be a key component of its implementation of DTV service. In this regard, we stated that we remain committed to the recovery of the channels temporarily assigned for the transition and to ensuring that the spectrum is used efficiently.

35. We stated that believe that an approach that uses portions of both the VHF and UHF TV spectrum for DTV service appears desirable. Based on studies by our staff in developing DTV allotments, we indicated that a core region of 270 MHz between channels 7 and 51 may be the most appropriate location for DTV broadcasting; that this region would be sufficient to accommodate all existing broadcasters; and that it would provide additional DTV frequencies for new entrants. We therefore asked for comment on two spectrum plans. Under the first, our "core spectrum" option, all future digital TV service would be located in a core region of the existing VHF and UHF broadcast spectrum, namely the spectrum at VHF channels 7 to 13 (174-216 MHz), and the spectrum at UHF channels 14-51 (470-698 MHz).⁷⁵ Figures 1 and 2 below show the existing NTSC television channels and the proposed spectrum to be used for digital television:

Figure 1 - Current NTSC TV Channels



⁷⁵ These bands correspond to the existing TV channels between VHF channel 7 and UHF channel 51. TV channel 37 (608-614 MHz) is currently used for radio astronomy research. In order to protect sensitive radio astronomy operations, TV Channel 37 currently is not used for NTSC broadcast television and also would not be used for DTV service.

Figure 2 - Proposed DTV Spectrum (Shaded Areas)



36. Under this core spectrum plan, we would attempt to provide all existing broadcasters with access to a 6 MHz channel for digital broadcasting within the core digital TV spectrum, *i.e.*, channels 7 to 51. Because of the limited availability of spectrum and the need to accommodate all existing facilities with minimal interference among stations, however, during the transition some broadcasters would be provided DTV channels outside of this area. These broadcasters would have to move their DTV operations to a channel in the core spectrum when one became available. Broadcasters whose existing NTSC channels were in the core spectrum could move their DTV operations to their NTSC channel at some time in the future. Broadcasters whose DTV transition channel and existing NTSC channel were both outside of the core area could obtain a new DTV channel when channels in the core spectrum are recovered.

37. We also indicated that this plan would allow the spectrum outside the core region to be recovered without a full channel repacking that would force many broadcasters to move to new channels twice. Specifically, this option would permit the eventual recovery of 138 MHz of spectrum nationwide. This spectrum would be obtained from the lower VHF channels, *i.e.*, channels 2-6 (54-72 MHz and 76-88 MHz), and upper UHF channels, *i.e.*, 52-69 (698-806 MHz). We observed that one advantage of this option was that it could facilitate the early recovery of a portion of the TV spectrum. For example, we stated that it may be possible to recover 60 MHz of spectrum almost immediately from the band 746-806 MHz, *i.e.*, UHF channels 60-69, while protecting the relatively few full-service analog and digital broadcasters in that spectrum. In this regard, we noted that only 97 of the almost 1600 television licensees operate on channels 60-69. In the draft DTV Table of Allotments included with the Sixth Further Notice, we attempted to minimize the number of DTV channels that would be located on channels 60-69.⁷⁶ The draft DTV Table was based on a "core spectrum" design that minimized -- but that did not eliminate -- digital allotments at channels 60-69. Where necessary to avoid undesirable interference, the draft Table used channels 60-69. The draft Table did so roughly 30 times.

⁷⁶ There are also a number of LPTV and TV translator stations that operate on a secondary basis on these channels.

38. We also requested comment on the alternative spectrum allotment/assignment plan for DTV service suggested by MSTV. The plan suggested by MSTV was based on principles that are similar to our proposals. That is, the MSTV preliminary Table was based on full accommodation of all broadcasters, attempts to provide stations with DTV coverage comparable to their existing NTSC coverage, and uses service replication to assign DTV channels. The principle difference between our draft DTV Table and MSTV's preliminary Table was with regard to the use of spectrum. While the two approaches use both VHF and UHF channels, the MSTV proposed approach does not attempt to concentrate all DTV operations within a core area of the spectrum.⁷⁷ Under this alternative approach, each broadcaster would be provided with a 6 MHz DTV channel without preference to any specific channels. Since all channels would be available, such an approach could theoretically provide for some degree of improved service area replication and interference performance. We also observed that such an approach might also have less impact on low power TV and TV translator stations. On the other hand, we noted that there were disadvantages with this plan. For example, this option would place more DTV stations on channels that are less desirable for broadcast operations; the MSTV Table included over 350 allotments on channels 60 and above.⁷⁸ We requested comment with regard to these two options. Commenting parties were also invited to address whether the different plans would have different effects on specific segments of the broadcasting industry such as LPTV and TV translator stations and the emerging networks.

39. We also requested comment on specific issues relating to the "core area" option. We asked that comments address whether our proposed choice of the spectrum for the core area was appropriate and whether there are any other considerations relating to this choice that should be addressed. In particular, we requested comment on our tentative conclusion that the upper UHF frequencies are less desirable for broadcasting purposes and more appropriate for other uses. Similarly, we requested comment on our assessment that VHF channels 2-6 are less suitable for digital broadcasting because of high levels of noise.

40. We further requested comment on what mechanisms and criteria we should use to determine the channel that will become the permanent DTV spectrum for each existing station. We tentatively proposed to allow broadcasters with both NTSC and DTV frequencies in the core DTV spectrum to choose one of those channels for their permanent DTV

⁷⁷ The MSTV proposal also contains a number of other differences. One difference, for example, is in the manner in which non-commercial vacant allotments are treated. MSTV did not consider commercial vacant allotments -- it stated that in most cases vacant allotments would have to be eliminated. It did, however, attempt to provide a replacement NTSC and DTV channel for all non-commercial vacant allotments. It was successful in finding a replacement NTSC channel for non-commercial vacant allotments in about two-thirds of all cases. MSTV was also successful in finding a replacement DTV channel in all but one case. The actual channels for these vacant allotments are not shown on the draft Table submitted by MSTV. LPTV and TV translator stations were not considered in the MSTV Table.

⁷⁸ This represents over 20 percent of the new DTV allotments.

spectrum. Under this plan, broadcasters would be required to make their spectrum choices within a specific period of time, e.g., three to five years, after the implementation of DTV service begins. Once these choices were made, the Commission would identify new DTV allotments that would be available for relocation of stations initially operating on frequencies outside the core area or for new DTV assignments.

41. We requested comment on whether we should adopt special transition provisions for broadcasters with NTSC channels or DTV allotments outside the core area. For example, where such a broadcaster's existing NTSC channel is outside the core should we allow the broadcaster to cease NTSC operation and permit early transition to a DTV channel in the core? In addition, where a broadcaster's existing NTSC channel is in the core and its DTV allotment is outside the core, we asked whether we should allow the broadcaster to convert its NTSC channel to DTV operation, rather than activate its "temporary" out-of-core DTV allotment. Finally, where a broadcasters' existing NTSC channel and DTV allotment are both outside the core area, we asked for comment on whether we should allow such broadcasters to wait to begin DTV operations until spectrum becomes available in the core area? This would allow some broadcasters to avoid making a second transition to convert to DTV. We specifically ask whether the above special transition approaches should apply to broadcasters with NTSC or DTV frequencies on channels 60-69.⁷⁹

42. In considering the spectrum issues relating to DTV implementation, we also observed that digital licensees may be willing to temporarily reduce the power of their digital signals to avoid interference to analog signals. We proposed to permit such agreements, including those that involve compensation. In addition, we noted that in some cases interference to NTSC stations can be minimized or eliminated by increasing the transmitter power or antenna height of the affected NTSC station. We proposed to permit such changes provided that they do not cause more than *de minimis* interference to neighboring DTV operations, and we proposed to permit agreements including compensation under which a DTV licensee would temporarily agree to accept a slightly elevated level of interference so that reception of an NTSC station is improved.

43. Comments. Most parties with broadcasting interests oppose proposals that would reduce the spectrum that is available for television broadcast purposes. These parties argue that no spectrum should be recovered prior to the end of the transition to DTV service. They argue that using all the channels without preference will provide increased flexibility for DTV implementation and mitigate interference and service area concerns. Parties representing LPTV and TV translator interests state that using all the spectrum would minimize the impact of DTV on their operations. The public safety community and most other land mobile interests, on the other hand, support the core approach and argue that spectrum recovery is needed to meet important communications needs, such as public safety.

⁷⁹ Cf. Fourth Further Notice, at para. 60.

44. The Joint Broadcasters, in their comments, oppose the core spectrum approach. They submit that we should adopt their Modified Table, subject to further adjustments.⁸⁰ They state that their Modified Table demonstrates that use of the full television band reduces interference to existing NTSC and to new DTV stations and improves opportunities for replication and maximization.⁸¹ The Joint Broadcasters argue that a channel plan that uses that entire band will provide for more flexibility during the transition to DTV. They state that experience is needed to identify the optimal spectrum into which DTV stations may be re-packed, thereby vacating contiguous spectrum for other uses.⁸² They also argue that the core approach would result in increased interference and would impact service replication.⁸³ They assert that the core approach would increase new interference to NTSC by 18%, and that interference to DTV service would be 28% less under a full band plan.⁸⁴ In addition, they claim that under their plan, 95% of stations would achieve 95% replication or better as compared to 91% of stations achieving 95% replication under a core approach. They argue that these service differences are important and contend that the Commission has held that the loss of service to even a relatively few viewers has been definitive in past relocation, deintermixture and maximum spacing decisions.⁸⁵

45. The Joint Broadcasters also argue that eliminating the core and spectrum recovery

⁸⁰ Joint Broadcasters comments, pp. 42-43, and 46-47.

⁸¹ To provide a basis for comparing our proposed spectrum plan with their full spectrum approach, the Joint Broadcasters used the draft DTV Table to create a "Baseline Table" that incorporates the core spectrum plan and their recommendations for modifying the assumptions/methodology used in allotting channels. The Joint Broadcasters' used the May 13, 1996, data base used in generating their Baseline Table. They did not update or otherwise make corrections to that data base. Joint Broadcasters comments, pp. 23-24. The Joint Broadcasters submit that, under their Baseline Table, new interference to NTSC service and interference to DTV service would be reduced and that a slightly smaller number of stations would receive a DTV channel that would achieve 95% or better replication. Joint Broadcasters comments, pp. 22-23.

⁸² Joint Broadcasters comments, p. 7.

⁸³ The Joint Broadcasters base their comparison on the differences between their Modified Table and a Baseline Table that is a modified version of the draft DTV Table that incorporates the Joint Broadcasters recommendations for changes in the technical methodology used in making allotments. Joint Broadcasters comments, p. 26.

⁸⁴ The Joint Broadcasters state that in determining the significance of improvements from one alternative DTV Table to another, it is important to settle on the method for comparing interference and coverage data. They recommend the method used by the Advisory Committee to evaluate competing DTV transmission systems. Under this method, interference performance is compared relative to how each alternative measures up against an ideal overall plan that would achieve 100% replication of NTSC service and create no new interference to NTSC service. Thus, if plan X creates 2% new interference, and plan Y creates 1% new interference, the difference between plans is 100%, not 1%. Joint Broadcasters comments, p. 25.

⁸⁵ Joint Broadcasters comments, pp. 28-31.

approaches would lessen the impact LPTV and TV translator stations.⁸⁶ They state that while there is not enough spectrum to preserve all existing low power stations, their approach would displace fewer LPTV and TV translator stations than the proposed core approach. They estimate that approximately 20% of all low power stations would be displaced under their Baseline Table and that an additional 16% would be displaced if channels 60-69 were recovered and made available for other uses during the transition. The Joint Broadcasters submit that they worked with the low power community in constructing their Modified Table, and include with their comments a list of the LPTV and TV translator stations that they believe would be displaced.⁸⁷

46. The Joint Broadcasters also contend that the selection of permanent channels for DTV is premature.⁸⁸ They argue that excluding channels 2-6 from the ultimate DTV spectrum is particularly problematic. They argue that in the absence of evidence that the lower VHF band is unsuitable for DTV operation, it is unwise and could be extremely disruptive to inform stations operating on the lower VHF channels -- long among the most desirable for their longer propagation range and lower power requirements -- that they will have to abandon their facilities at the end of the transition.⁸⁹ They also argue that their modified full band approach would provide many stations with the opportunity to increase their service areas beyond their NTSC service area.⁹⁰ They argue that the benefits of the core spectrum approach are speculative and uncertain and that their approach would result in the eventual return of essentially the same amount of spectrum. They further argue that the assumed economic benefits of the core approach and spectrum recovery proposals have been greatly overrated and contend that the proposed early auction of segments of channels 60-69 would earn far less than a later auction of contiguous spectrum.⁹¹

⁸⁶ Id., pp. 27-28.

⁸⁷ Id., pp. 33-34.

⁸⁸ Id., p. 35.

⁸⁹ Id., pp. 36-37.

⁹⁰ Id., p. 40.

⁹¹ Broadcasters contend that the amount of useable spectrum that would be available for relocation under our proposed approach is about the same small amount as that which would be available under their Modified Table. They submit that the buffer zones needed to protect the 97 incumbent NTSC stations and the 51 DTV stations overlap substantially with the zones needed to protect the 139 DTV stations their Modified Table would create. (pp. 40-41) Broadcasters submit that the potential value of the spectrum that would be available for reallocation is vastly reduced by its location (rural) and fragmentation (approximately 12 MHz blocks). Broadcasters also include with their comments a report by Dr. Jerry Hausman of MIT that indicates that the early recovery of smaller amounts of non-contiguous spectrum is likely to be a less economically efficient solution than later recovery of larger blocks of contiguous spectrum. Using data collected from the PCS spectrum auctions, Dr. Hausman concludes that the government could earn 2.3-10.6 times more revenue (on a net present value basis) by waiting 15 years to auction channels 60-69 in a cleared spectrum block. He also calculates the

47. Other broadcasting parties expressed similar views. AAPTS, for example, states that the full broadcast band should be used for DTV during the transition period.⁹² It states that such an approach will afford more opportunities for coverage maximization and will reduce the adverse impact of DTV allotments on noncommercial translators. Chris-Craft/United Group (Chris-Craft) recommends that we maintain maximum flexibility for modifying the initial allotments.⁹³ To this end, it argues that we should not adopt the core spectrum proposal. Similarly, Freedom Communications, Inc. (Freedom) believes that the full amount of spectrum currently allocated for TV should continue to be available in the future, particularly in the transition period.⁹⁴ KARK-TV, Inc., opposes the core spectrum proposal.⁹⁵ It argues that because the DTV has not been thoroughly tested, broadcasters will need flexibility to work out allotment problems during the transition and for a considerable period thereafter. It also contends that there has been no immediate demand for more frequencies by other services demonstrated.

48. Harris Corporation (Harris), a manufacturer of television transmitters, states that it is important to maintain flexibility during the DTV implementation stage by utilizing the full television spectrum for DTV allotment purposes.⁹⁶ Similarly, AFCCE recommends that we retain the entire UHF TV spectrum until DTV interference issues are resolved.⁹⁷ Thomas C. Smith believes that our DTV spectrum plan should consider the future growth of broadcast television, the need for additional full service stations and the future of secondary TV translators and low power TV stations.⁹⁸ He is concerned that the overriding consideration in this proceeding is to raise revenue for the U.S. Treasury, rather than the technical and growth needs of the existing industry.

49. National Broadcasting Company (NBC) submits that a critical element in maintaining the flexibility to make changes to the DTV Table is not to arrive at a premature

consumer value lost to increased interference that would result from the core channel approach. Using a Boston station as the basis for his analysis, Dr. Hausman concludes that the loss in consumer value alone is between 3.5 and 4.7 times higher than the revenue that the Commission would raise in an early auction of the spectrum.

⁹² AAPTS comments, pp. 12-15.

⁹³ Chris-Craft comments, pp. 6-7.

⁹⁴ Freedom comments, p. 3.

⁹⁵ KARK comments, p. 1-3.

⁹⁶ Harris comments, p. 3.

⁹⁷ AFCCE comments, p. 16.

⁹⁸ Smith comments, p. 2.

conclusion as to which parts of the spectrum may be best for DTV operation.⁹⁹ It states that, for example, it believes that the low band VHF channels are entirely suitable to carry DTV signals. It states that the advantages of longer range propagation with significantly lower power compensate for the characteristics of the low-band VHF frequencies that can impair DTV service.

50. Several other parties also argue that the low VHF channels should continue to be available for future DTV operations. DLR, for example, urges that we retain the low VHF channels for TV use.¹⁰⁰ It disagrees with our initial assessment that the low VHF channels are less suitable for DTV service because of high levels of atmospheric and man-made noise. It submits that the DTV field tests performed on channel 6 at Charlotte, NC, while limited in sample size and interference experienced, indicate that DTV service was substantially better than NTSC service in the presence of impulse noise. Citadel Communications Co., Ltd. (Citadel) proposes that VHF channels 2 to 6 be retained and that stations currently licensed on those channels be permitted to return to those channel locations for final DTV operations. It believes that the various technical penalties of operating there (leaky power lines, ignition noise, and educational FM interference) deserve more study before the band is discarded for DTV.¹⁰¹

51. Silver King Communications, Inc. (Silver King) states that our plan for early recovery of channels 60-69 would create additional interference, impede the maximization and modification of NTSC and DTV facilities, and give TV receiver manufacturers an incentive to omit channels 60-69 from new TV sets.¹⁰² It states that this would unfairly and uniquely limit the ability of Silver King, with eight major market stations on channels between 60 and 69, to compete in the NTSC and DTV marketplaces. Silver King states that new service providers should be required to compensate broadcasters for the cost of relocating their DTV channels to the core spectrum area. Telemundo Group, Inc. (Telemundo) and UCI argue that we should reject the core spectrum plan and retain the current broadcast spectrum. Telemundo is concerned that as spectrum outside the core is recovered for other uses, the non-core channels will become subject to increasing levels of interference.¹⁰³ It also argues that TV set manufacturers may stop building receivers that tune channels outside of the core spectrum. UCI argues that the proposals for mitigating the impact on low power stations will have little impact if an artificial contraction of the broadcast spectrum, as would occur under our core

⁹⁹ NBC comments, p. 2.

¹⁰⁰ DLR comments, p. 6.

¹⁰¹ Citadel comments, pp. 2 and 5.

¹⁰² Silver King comments, pp. 3-6 and summary, p. 1.

¹⁰³ Telemundo comments, p. 20.

spectrum plan, leaves no digital or replacement channels available for LPTV licensees.¹⁰⁴ Pappas Telecasting Companies (Pappas) submits that the benefits that might accrue from auctioning spectrum from channels 60-69 before the completion of the transition to DTV are at best speculative and states that this spectrum could be worth significantly more if it were to be auctioned as a cleared block.

52. WB Television Network (WB) states that the core plan would reduce the number of channels that are available for new TV stations and thereby impact new networks.¹⁰⁵ Rather than adopt the core spectrum option, WB urges that we delay making any decision about the precise amount of spectrum to be recovered until after the transition to DTV is complete and after the pending applications and rule making proceedings for new NTSC stations have been acted on.

53. Parties with interests in low power operations, both LPTV and translators, are generally concerned that the core approach and channel 60-69 spectrum recovery efforts would result in additional impact to their operations. Acadiana Cable Advertising, Inc. (Acadiana), for example, opposes the core spectrum approach and the plan for early recovery of channels 60-69.¹⁰⁶ It argues that shrinking the available spectrum would effectively eliminate LPTV and TV translator stations and would result in loss of program diversity. Apogee Broadcasting Corp. (Apogee) submits that our proposed core spectrum plan makes finding a replacement channel more difficult.¹⁰⁷ Apogee acknowledges that eventual auctioning of unused spectrum would offer taxpayers a financial benefit, but urges that any such action be deferred until the end of the transition.

54. The Community Broadcasters Association (CBA) argues that we should postpone any spectrum reallocation until more is known about the transition process. CBA states that channels 60-69 are more heavily populated by LPTV and translators than full power stations.¹⁰⁸ The National Translator Association (NTA) submits that all the TV spectrum should be retained until all stations are converted to digital.¹⁰⁹ It argues that it would be unfair to people in rural areas to require translator operations to move again as they have done from above channel 69. F. A. Bibeau & Associates (Bibeau) states that in the Southwest area of the U.S., especially the Mountain States, there are few full power TV

¹⁰⁴ UCI comments, p. 8.

¹⁰⁵ WB comments, pp. 5-6.

¹⁰⁶ Acadiana comments, pp. 2 and 4.

¹⁰⁷ Apogee comments, pp. 1 and 3.

¹⁰⁸ CBA comments, pp. 10-11.

¹⁰⁹ NTA comments, p. 4.

stations and a greater portion of the population receive their only television service by translators.¹¹⁰ It submits that channels 60-69 are needed for TV translators to provide service to these unserved areas. Blue Mountain Translator District (Blue Mountain) states that the TV spectrum in central and eastern Oregon is being used in its entirety and that removing channels 60-69 would impact reliable broadcast services to communities in northeastern Oregon.¹¹¹ WatchTV states that if we move to reclaim channels 60-69, the new service providers should be required to compensate LPTV licensees for their existing investment or for moves to new channels to accommodate new entrants.

55. The Department of Special Districts, San Bernardino County, CA (DSD) submits that we should not re-allocate channels 60-69 until after the transition to DTV is completed in order to protect the operation of LPTV and TV translator services.¹¹² It argues that no spectrum reallocation, the purpose of which would be to garner revenue for the U.S. Treasury, should result in any direct or indirect cost to Special Districts' taxpayer-created and financed services without 100% restitution, paid by either the U.S. Government or by the successful bidder at auction or other new user. The DSD also submits that, to the extent possible the DTV Table should be modified, to encourage all stations to revert to their existing channel after the transition.

56. KUED-TV and KULC-TV (KUED-TV) argue that further consideration should be given to preservation of the existing TV translators and LPTV stations in allotting DTV channels.¹¹³ KUED-TV submits that the loss of one translator could cause loss of service to many communities. It argues that because of this "domino" effect, the number of translators affected by DTV could be up to 3 or 4 times higher than estimated. The International Broadcasting Network (IBN) argues that our DTV proposals must accommodate all existing television stations, including the nation's approximately 2,000 low power stations and more than 1,500 full power television stations, on a fair and equitable basis.¹¹⁴

57. Tiger Eye Broadcasting Corporation (Tiger Eye) submits that community broadcast television is perhaps the only source where viewers can consistently watch locally-televised events.¹¹⁵ It requests that channels 60-69 be retained in order to preserve low power television service. Raoul Lowery Contereras argues that LPTV stations provide for minority/ethnic participation in mass communications and provide coverage of minority/ethnic events that are ignored by full power broadcasters. He asks that we revise our proposed rules

¹¹⁰ Bibeau comments, pp. 1-2.

¹¹¹ Blue Mountain comments, pp. 2-3.

¹¹² DSD comments, pp. 6-7, 10, and 12

¹¹³ KUED-TV comments, pp. 3-4 and 9.

¹¹⁴ IBN comments, p. 5.

¹¹⁵ Tiger Eye comments, pp. 1-2.

and policies for DTV to protect LPTV.¹¹⁶ WJYL-LP 26 (WJYL) urges that LPTV service be preserved at all costs. It states that many in the low power industry have invested their life savings and credit into the financing of their stations.¹¹⁷ WJYL recommends that we allocate a group of channels for LPTV service. Community Teleplay, Inc. (CTI) submits that frequencies between 52-59 should be set-aside band for displaced LPTV stations.¹¹⁸

58. The Benton Foundation (Benton) argues that we should adopt an allotment plan that includes LPTV stations and provides for their continued success in the DTV era.¹¹⁹ Independent Broadcasting Company (IBC) states that we should attempt to facilitate the transition of TV translators to DTV operations in a manner that will not impact full service DTV conversion.¹²⁰ It argues, however, that LPTV is a failed experiment and that we should not treat LPTV stations any different than TV translators.

59. Several parties with broadcast interests support the core approach, suggest modifications to the core concept or support approaches that would limit DTV allotments to the UHF band or portions of the UHF band. KSCI-TV and LABCTS, for example, support the concept of a core spectrum. They submit that excess spectrum should be returned for other purposes but that enough spectrum should be maintained for broadcasting to provide an interference free transition and continued operation of DTV.¹²¹ KSCI-TV and LABCTS recommend that DTV be implemented in a core spectrum of channels 22-66. They state that this would simplify receiver design and antenna problems. They submit that this would release the existing VHF TV spectrum and make channels 14-21 contiguous with the existing land mobile spectrum now ending at 470 MHz.

60. National Public Radio (NPR) supports our proposal to allot DTV channels in a manner that would permit the early recovery and auction of channels 60-69.¹²² It states that a portion of the auction proceeds should be used to support public broadcasting. It asks that if there are insuperable technical barriers to the early recovery of this spectrum, we continue to pursue and support other appropriate mechanisms to sustain the public broadcasting system. BET states that we should adopt our core spectrum proposal and other mechanisms to recover spectrum quickly and efficiently in order to be able to conduct auctions for the recovered

¹¹⁶ Contereras comments, pp. 1-3.

¹¹⁷ Watch TV, p. 2.

¹¹⁸ CTI comments, p. 5.

¹¹⁹ Benton comments, pp. 6-7.

¹²⁰ IBC comments, p. 3.

¹²¹ KSCI-TV comments, pp. 2-3; LABCTS comments, at p. 2.

¹²² NPR comments, p. 1.

spectrum in a manner that encourages new entrant participation.¹²³ It also states that the core spectrum approach will promote rapid efficient recovery of vacated spectrum and is far superior to the first-come/first-served approach we proposed earlier.

61. Lewis supports our earlier proposal to allot all DTV channels to the UHF band. It submits that this approach would provide strong encouragement for medium and small market stations to participate in the transition to DTV technology.¹²⁴ The LABCTS believe that DTV should be implemented in a core spectrum of contiguous UHF channels. They submit that this approach would simplify receiver design and antenna problems. VictoriaVision, Inc. (VVI) requests that we locate all DTV allotments in the UHF band.¹²⁵ It argues that locating all TV stations in the same band would eliminate the existing disparities between VHF and UHF stations and simplify receiver and antenna designs.

62. Fox recommends that low band VHF channels generally not be used for DTV allotments due to the crowded nature and propagation characteristics of this band.¹²⁶ Cannell Cleveland, L.P. (Cannell) argues that both our core spectrum plan and the alternative approach supported by the Joint Broadcasters appear to exacerbate the disparities between UHF and VHF stations.¹²⁷ To address these concerns, Cannell recommends that we establish a DTV core spectrum that is entirely within the UHF band. Holston also recommends that all DTV channels be located in the UHF band as a means to avoid impulse noise in the VHF bands and to avoid repacking stations at the end of the transition.¹²⁸ It submits that modern UHF transmitters can be operated throughout the band with only minor modifications and that this would minimize the cost of any re-packing that would be necessary. Kentuckiana believes that in order to place all broadcasters on a level playing field, DTV service should be located entirely in the UHF band.¹²⁹ It submits that locating all DTV stations in the UHF band would finally eliminate the disadvantages that UHF stations face with respect to VHF stations. It states that the result would be a stronger overall television system.

63. The public safety community and other land mobile parties strongly support proposals that would permit spectrum recovery. The Association of Public-Safety Communications Officials-International, Inc., (APCO) supports the plan to allot DTV

¹²³ BET comments, pp. 7 and 9.

¹²⁴ Lewis comments, pp. 4-5.

¹²⁵ VictoriaVision comments, pp. 1-2.

¹²⁶ Fox comments, p. 3.

¹²⁷ Cannell comments, pp. 2-3.

¹²⁸ Holston comments, p. 4.

¹²⁹ Kentuckiana comments, pp. 2-3.

channels in a manner that would allow for reallocation of channels 60-69 for other services.¹³⁰ APCO notes that one of the key findings of the *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and the National Telecommunications and Information Administration*, September 11, 1996, is that public safety needs an additional 25 MHz of spectrum within the next five years. It states that the spectrum now allocated for channels 60-69 would be extremely valuable for public safety and is immediately adjacent to the 800 MHz frequency bands already allocated for public safety operations. It further observes that the impact on existing TV service and DTV implementation would be *de minimis*. APCO asks that at least 24 MHz be made available to public safety within five years.

64. APCO also states that we should reduce and, if possible, avoid channel 60-69 DTV allotments altogether.¹³¹ It submits that to the extent that it is necessary to place any DTV allotments on channels 60-69, we should adopt strict guidelines by which stations must either initiate DTV service or relinquish the channel for reallocation. It states that we should also attempt to concentrate the DTV allotments on particular channels rather than scattering them across all ten channels. APCO indicates that such concentration would allow the reallocation of common frequencies to public safety across the country. APCO argues that while it understands the situation of low power TV stations, the radio spectrum is a finite resource subject to reallocation in the public interest. It states that low power TV stations were granted licenses on a secondary basis, and have always been on notice that their operations could be temporary. APCO opposes requiring new users of channels 60-69 to compensate low power licensees for their displacement, at least insofar as it would apply to new users that are state and local government agencies. It argues that public agencies have limited resources that will be needed to implement the new public safety systems on those frequencies.

65. APCO further states that there is a substantial need for new public safety spectrum in the lower VHF band above 174 MHz (adjacent to current 150-174 MHz land mobile bands) and in the lower UHF band at 470-512 MHz (channels 14-20, where land mobile sharing already exists in eleven major markets).¹³² APCO states that additional spectrum is needed in these bands to provide for enhanced interoperability, especially for wide area operations for state police and similar agencies. It therefore recommends that we modify our core spectrum proposal to allow for the eventual recovery of spectrum in the range of VHF channels 7-8 (174-186 MHz) and UHF channels 14-20 (470-512 MHz). It states that to offset the impact of making additional spectrum below 512 MHz available for public safety, we could either use VHF channels 5-6 as part of the DTV core spectrum, or extend the DTV core spectrum one or two channels above channel 51.

¹³⁰ APCO comments, pp. 2-3, 6-7, and 10-11.

¹³¹ APCO comments, p. 13.

¹³² APCO comments, pp. 3-4 and 16.

66. In a joint letter submitted on February 26, 1997, APCO et. al., states that we must not delay any further in addressing public safety needs.¹³³ These parties disagree with the broadcasting interests that reallocation of channels 60-69 should be delayed for several years. These parties further observe that the process of making new public safety spectrum available and constructing systems to operate on that spectrum will not be completed overnight. APCO et. al. therefore urge that we allocate spectrum in channels 60-69 now, so that implementation of new public safety systems can begin as soon as possible. To facilitate this process, they also urge that the DTV allotment plan eliminate or at least minimize, the number of DTV allotments on these channels.

67. The County of Los Angeles (LA County) states that it supports our DTV allotment proposals, including the plan for recovery of channels 60-69 for other uses.¹³⁴ It urges that a significant portion of reallocated spectrum be made available for public safety use and states that many governmental entities in Southern California have substantial need for more spectrum to modernize overburdened communications, to provide interoperability, and allow for the implementation of new communications technologies for public safety. LA County also states that it supports the suggestion made in APCO's comments that we modify the core spectrum plan to allow for eventual public safety use of VHF channel 7, and to facilitate additional land mobile sharing of UHF channels 14-20. It argues that elimination of channels 60-69 would have minimal impact on current television broadcasters. It also supports the proposal to continue the secondary status of low power television stations and argues that public safety agencies should not be required to compensate such secondary licensees for terminating operation or relocating to other spectrum.

68. Department of Communications, County of Bucks, Pennsylvania (DOCBC) submits that there is an urgent need in many parts of the country, including the Philadelphia area, for additional public safety radio channels.¹³⁵ It points out that the PSWAC, in its recently released Final Report found that public safety agencies need at least 2.5 MHz of additional spectrum immediately for interoperability, at least 25 MHz within 5 years, and an additional 70 MHz within the next 15 years. AC Transit submits that the San Francisco Bay area has a serious shortage of available frequencies to support the communications needs of its transit systems.

69. The Land Mobile Communications Council (LMCC) states that our proposal for

¹³³ See letter of February 27, 1997, from APCO, the International Association of Chiefs of Police, International Association of Fire Chiefs, International Municipal Signal Association, International Union of Police Associations, AFL-CIO, League of California Cities, National Association of Telecommunications Officers and Advisors, National Conference of State Legislatures, National Coordinating Council on Emergency management, National League of Cities, City of New York, and County of Los Angeles.

¹³⁴ LA County comments, pp. 2 and 6-9.

¹³⁵ DOCBC comments, p. 1.

recovery of a portion of the existing broadcast television spectrum for new uses is a win-win situation that accommodates both DTV operations and new mobile operations.¹³⁶ It submits that the spectrum in channels 60-69 is adjacent to existing mobile service allocations at 800 MHz and therefore would be of significant benefit for land mobile use. It states that this spectrum could, for example as noted in the Sixth Further Notice, be licensed through competitive bidding for flexible mobile operations; a portion of it could be used to meet public safety needs; and/or a portion could be designated temporarily or permanently for LPTV and TV translator stations. The LMCC also suggest some of the recovered spectrum could be used to meet the communications needs of electric and water utilities, petroleum producers, railroads, transportation facilities and many smaller businesses. LMCC suggests several modifications to our DTV allotment proposals. First, it recommends that we reexamine the draft Table to determine whether alternative solutions exist that would avoid the need to make any DTV allotments on channels 60-69. Second, it states that we should establish some mechanism to retire NTSC operation on channels 60-69 in a timely manner. It suggests that, given the relatively poor propagation of broadcast signals in this band, we should examine the extent to which the audience share for the approximately 100 NTSC stations on channels 60-69 is actually achieved over cable rather than over-the-air.

70. In a letter submitted March 14, 1997, the LMCC states that the Commission and the American public will not reap the full benefits of the DTV allotment plan unless prompt action is taken to make more efficient use of the spectrum represented by TV channels 60-69. It urges that we pursue a schedule that would lead to: 1) adoption of a Notice of Proposed Rule Making by May 1, 1997, for the reallocation of channels 60-69 for public safety, critical industries/businesses and CMRS uses, and licensing and service rules to implement the reallocation, 2) adoption of a Report and Order finalizing the reallocation by August 1, 1997, or sooner; and 3) adoption of a Report and Order finalizing service rules for land mobile use of channels 60-69 by December 31, 1997, or sooner.

71. UTC, the Telecommunications Association, urges that we initiate a proceeding to immediately allocate the channel 60-69 band to meet the needs of public safety and to address the needs of the private radio community.¹³⁷ In particular, UTC argues that a portion of the recovered spectrum could be used to 1) address congestion in the private land mobile bands below 512 MHz, 2) accommodate relocated users from the 800 MHz band, 3) meet anticipated growth in private land mobile operations, and 4) permit the introduction of new and innovative technologies. UTC also states that entities, such as utilities and pipelines, have a need to interoperate with public safety agencies. It believes that the channel 60-69 band would be ideal for this interoperability band.

72. Ericsson Inc. (Ericsson) supports the core spectrum concept but suggests that by

¹³⁶ LMCC comments, pp. 1-2, 7-8, and 12.

¹³⁷ UTC comments, pp. 1, 4, and 6.

repacking the UHF broadcast spectrum it may be possible to free up additional radio spectrum for other uses or more broadcast channels.¹³⁸ Ericsson believes that it is likely that a core spectrum area smaller than the 44 channels proposed in the Sixth Further Notice could provide all broadcasters with DTV facilities comparable to their existing NTSC facilities. It notes that the UHF TV channels are lightly packed with only about 18 stations per channel. Ericsson submits that if the post transition core spectrum were packed only as tightly as VHF stations are packed now, *i.e.*, 58 stations per channel, then only about 30 channels would be needed to accommodate DTV. It states that such a compact plan would ultimately free up more than 200 MHz of spectrum. Ericsson also recommends that we modify our core spectrum proposal to free spectrum at the lower UHF TV band and to leave channels 7 and 8 out of the core spectrum. While it acknowledges that it would be extremely difficult and disruptive to relocate existing channel TV operations, it states that freeing these channels after this transition would be less difficult. It notes that our draft Table proposes only 10 DTV allotments for channel 7 and 14 allotments for channel 8. It submits that these allotments could be moved to other channels so that channels 7 and 8 could be left free of DTV operations.

73. Motorola supports our proposals to adopt DTV allotment criteria that promote both the near term and long term recovery of underutilized broadcast television spectrum.¹³⁹ It states that this proceeding presents perhaps the last opportunity to foster major improvements in the efficient use of the spectrum below 1 GHz. Motorola agrees with our initial assessment that recovery of significant portions of the television spectrum can occur without reducing the number of broadcast outlets. It states that given the more robust nature of the DTV technology, as opposed to the existing NTSC service, we will be able to use a higher percentage of the television allocation. It agrees that once the transition is complete, all existing broadcast operations will be able to co-exist within channels 7-51 with capacity remaining for additional allotments.

74. Motorola states that it strongly supports the proposal to provide for early recovery of channels 60-69.¹⁴⁰ To this end, it submitted two DTV Tables or "solutions" that it says would further limit the number of DTV allotments on channels 60-69. Motorola states that by focusing on the allotment of new channels for the DTV allotments proposed for channels 60-69, while attempting to maintain a constant "cost" factor imposed on broadcasters, it was

¹³⁸ Ericsson comments, pp. 3-4, 5, 7, and 12-13.

¹³⁹ Motorola comments, pp. 1 and 5.

¹⁴⁰ Motorola comments, p. 9. Motorola indicates that it used our DTV allotment software to analyze whether the number of allotments could be reduced below the number proposed in the draft Table. Motorola indicates that by placing a higher "penalty" on use of channels 60-69 and increasing the priority for maintaining the level of existing protection to land mobile stations operating on channels 14-20, it was able to significantly improve our proposed plan from the perspective of enhancing the opportunity for early recovery of channels 60-69.

able to reduce the number of DTV allotments on channels 60-69 from 30 to 5. It states that this Table was achieved with only a minor increase in the "cost" of the solution as calculated by the software.¹⁴¹ It submits that this solution would result in no DTV operations on 5 of the 10 channels between 60-69. It also indicates that by "short-spacing" a few DTV allotments it was able to further reduce the number of DTV allotments in channels 60-69 from 5 to 2. In addition, it states that these solutions maintain interference protection for land mobile stations now occupying portions of the 470-512 MHz band (channels 14-20) in certain cities. In its reply comments, Motorola states that the performance of the Joint Broadcaster's Modified Table is insignificantly different (1.5% vs. 1.6% reduction in service area) from the Motorola solution considering that its cost precludes the possibility of early recovery of channels 60-69.¹⁴²

75. Citizens for a Sound Economy Foundation, et al. (CSEF) submits that our proposal to locate DTV channels in the core spectrum area constitutes a more efficient assignment of the spectrum, and that to the extent that it obviates the need for later repacking will permit swifter recovery of spectrum, which could then be used for other purposes.¹⁴³ It states that to the extent that our proposal permits channels 60-69 to be made available for other uses, it would provide some immediate compensation for the broadcasters' use of 12 MHz. It urges that we reallocate these channels as soon as possible in a subsequent proceeding.

76. Decision. We continue to believe that the spectrum principles set forth in the Sixth Further Notice are appropriate. We believe that it is important to provide broadcasters with spectrum that is most appropriate and technically suitable for DTV. In this regard, we have developed a Table of DTV Allotments that attempts to provide all eligible broadcasters with a DTV allotment within channels 2-51 without bias against the use of any channel in this band.¹⁴⁴ Where necessary, however, channels outside this region are also used. We believe that approach will provide for full accommodation of all eligible broadcasters in a manner that minimizes interference to existing NTSC service and provides for a high degree of service area replication by new DTV facilities. We also continue to believe that we can accomplish these goals in a manner that ensures that the radio spectrum is used efficiently and effectively. In this regard, we believe that the public interest is best served by

¹⁴¹ Motorola also submits that in subsequent analyses where it allowed "short-spacing" between co-channel DTV allotments it was able to reduce the number of DTV allotments on channels 60-69 to two. Motorola states that in some cases short-spacing allotments at distances less than the 175 km "hard limit" we used may be appropriate solutions where terrain and other considerations minimize its impact.

¹⁴² Motorola reply comments, pp. 8-9.

¹⁴³ CSEF comments, pp. 2-3.

¹⁴⁴ As previously noted, channel 37 is not used in order to protect existing radio astronomy uses.

developing a Table of DTV Allotments that meets the DTV spectrum needs of broadcasters during the transition; facilitates the early recovery of spectrum from channels 60 to 69; and also facilitates the eventual recovery of 138 MHz of spectrum currently being used for analog broadcasting.

77. In this regard, we do not believe that either the early recovery of channels 60-69 or our core approach will have a significant impact on the flexibility needed for the implementation of DTV. We note that the ATSC digital system has been rigorously tested and studied. We also note that significant industry efforts have gone into developing the technical planning criteria to be used in the implementation of DTV. We believe that the Table we are adopting is fully consistent with these technical decisions. We also note that if DTV implementation problems do arise, they are most likely to do so in the most congested markets where channels within the 60 to 69 range will already be in use by either NTSC or DTV operations and thus will not be available to solve such implementation problems. Accordingly, while we are confident that problems in implementation will not arise, we believe that if they do they will better be addressed through technical solutions other than relying on channels 60-69. For example, some technical solutions to unexpected interference could include using directional antennas or limiting power and/or antenna height during the transition.

78. We find that the impact of our core and spectrum recovery approaches on interference and service replication to be insubstantial.¹⁴⁵ We disagree with those parties that assert that these approaches would impact the implementation of DTV by full service broadcasters. Under the DTV Table we are adopting, almost 99% of all existing NTSC service areas and viewers will be unaffected by the implementation of DTV operations. In addition, 93% of all DTV allotments would provide at least 95% service area replication.¹⁴⁶ Further, the DTV Table accommodates more than 100 additional new NTSC stations and provides DTV allotments for these stations. It also eliminates all but one of the land mobile sharing problems that were present in both the draft and the Joint Broadcasters' Tables. In

¹⁴⁵ The cumulative differences in interference and service replication between the draft Table contained in the Sixth Further Notice and the Table submitted by Joint Broadcasters was less than 1%. We believe that such a difference is not scientifically "significant" or is at best *de minimis* when considering the accuracy and probabilistic nature of the propagation and other engineering models used to calculate both interference and service area. We note, for example, that considerable debate took place within our Advisory Committee with regard to the planning factors for DTV. We further note that Industry Canada has suggested that it would use somewhat different engineering planning factors for the development of DTV in its country. Changing certain DTV planning factors would have a significantly greater impact than 1% on the interference and service replication calculations. Furthermore, the actual implementation of DTV will likely vary considerably from that assumed in the calculations. For example, many broadcasters will not be able to use their existing towers or transmitter sites for DTV. These practical implementation considerations will likely result in significantly greater differences than those calculated between the two draft Tables. We believe that all of these factors warrant a conclusion that the very small differences in the two different approaches are insignificant.

¹⁴⁶ This level of replication is calculated based on a 1 MW power limit for DTV operations.

summary, we find that the DTV Table will fully meet the needs of broadcasters during the DTV transition. We believe that cumulative differences in interference and service replication between the Table we are adopting and approaches suggested by the Joint Broadcasters are *de minimis* and are clearly outweighed by the benefits to be achieved through our core and spectrum recovery plans.

79. We also disagree with those broadcasting parties that assert that we should not recover early channels 60 to 69 because there is no need for additional spectrum by other services. We believe that the record clearly demonstrates that additional spectrum is required to meet the needs of public safety and other land mobile services. As indicated by APCO, LA County, the Governor of New Jersey and the many governmental organizations that filed comments in this proceeding, there is an urgent need for additional spectrum to meet important public safety needs, such as broadband data transmissions of fingerprints, mugshots, criminal histories, building diagrams, hazardous material information, medical images and related emergency response data. The record also strongly supports a conclusion that spectrum in the region of channels 60-69 is appropriate to meet some of these needs. As indicated by several parties, the proximity of existing land mobile communications systems to channels 60-69 would permit equipment economies and could enhance interoperability between future public safety systems and current systems now operating in the 800 MHz land mobile bands. Accordingly, as indicated above, our DTV Table of Allotments minimizes the use of channels 60-69 to facilitate that early recovery of this portion of the spectrum.

80. We will initiate a separate proceeding in the very near future to address how to allocate available spectrum at channels 60-69. In our recent Report and Order in the WCS proceeding, we stated that we would give serious consideration to allocating 24 MHz for public safety use.¹⁴⁷ We will also consider whether some or all of the remaining 36 MHz could be assigned by auction. All existing NTSC and DTV full service broadcast operations on these channels will be fully protected during the transition. We will also address whether to require compensation by new service providers to full service or low power operations for the displacement or relocation of such operations from channels 60-69. With regard to eventual recovery of spectrum beyond channels 60-69, our planning for the future recovery of such additional spectrum does not in any way prejudice the potential uses of that additional

¹⁴⁷ See Report and Order in GN Docket No. 96-228, adopted February 19, 1997, FCC 97-50. We also observe that legislation recently introduced by Senator McCain would direct the Commission to allocate 24 MHz of the channel 60-69 spectrum to public safety use within 30 days of enactment of the legislation, and that the Administration has stated its support for such a reallocation. Senator McCain's proposed legislation would also require assignment by auction for commercial use of the remaining 36 MHz of recovered spectrum at channels 60-69. See S.255, The Law Enforcement and Public Safety Telecommunications Empowerment Act, as introduced in the United States Senate on February 4, 1997, Section 4(a); see also Testimony of Larry Irving, Assistant Secretary for Communications and Information, U.S. Department of Commerce, before the Subcommittee on Telecommunications, Trade and Consumer Protection of the U.S. House of Representatives Committee on Commerce, February 12, 1997, at 24; see also Statement by Attorney General Janet Reno on Proposal to Set Aside communications frequencies for Public Safety Use, released February 6, 1997.

spectrum or the services that might operate thereon.

81. With regard to LPTV and TV translator stations, we continue to believe that the principal impact on low power operations will be from the accommodation of all full service broadcasters with a second channel for DTV. Further, we find that the potential benefits of recovering channels 60-69, as discussed above, outweigh any additional impact this plan may have on low power operations. Nevertheless, as we discuss below at paragraphs 141 to 146, we are taking a number of significant steps to mitigate this impact. We therefore continue to conclude that LPTV and TV translator stations should retain their secondary allocation status.¹⁴⁸

82. *DTV Core Spectrum.* One of our principal concerns is to provide broadcasters with the best possible spectrum for DTV operation. In the Sixth Further Notice, we stated our belief that channels 7-51 are the most suitable frequencies for DTV service. We noted that TV operations on the lower VHF channels 2-6 are subject to a number of technical penalties, including higher ambient noise levels due to leaky power lines, vehicle ignition systems, and other impulse noise sources and interference to and from FM radio service. At the same time, we recognized that the lower VHF channels 2-6 offer unique technical characteristics for broadcasting, particularly with regard to propagation. Finally, we observed there are propagation limitations for TV service on higher UHF channels.

83. Our core concept was designed to facilitate and minimize the cost to broadcasters of spectrum recovery. A number of commenting parties, however, strongly urge that the core spectrum be modified to include channels 2-6. Other parties agree with our initial assessment that these channels may not be appropriate for DTV. We, therefore, believe that best approach at this time is to develop the DTV Table of Allotments based on use of channels 2-51. Accordingly, we have modified our allotment software to attempt to locate all DTV channels within this portion of the spectrum. If the lower VHF channels 2-6 prove acceptable for DTV use, we will consider retaining these channels for DTV and adjusting the core spectrum to encompass channels 2-46 rather than channels 7-51. We do not believe that expansion of the core, or elimination of our computer allotment penalties, to include channels above channel 51 is warranted or would significantly reduce interference. Further, such an approach would lead to additional assignments outside the DTV spectrum core area, thereby increasing the number of second channel moves, with concomitant costs, for broadcasters. Accordingly, the DTV Table of Allotments, adopted herein, is based on use of channels 2-51. This approach will allow us to monitor closely the experiments and early implementation of DTV operations before determining the core spectrum for DTV.

84. We also will allow broadcasters, wherever feasible, to switch their DTV service to their existing NTSC channels at the end of the transition if they so desire. Such channel

¹⁴⁸ As noted above, our decisions with regard to this issue have been upheld on judicial review in Polar Broadcasting v. F.C.C., 22 F.3d 1184 (D.C. Cir. 1994) (table).

switches would be permitted provided that the station's existing channel is within the final DTV core spectrum. Stations, with both NTSC and DTV channels outside the core spectrum, will be assigned new channels within the core from recovered spectrum. We note that the new Table contains 68 instances where both channels are outside of channels 7-51 and 89 instances where both channels are outside of channels 2-46.

D. Allotment Preference

85. In most instances, the choice of channels for a DTV allotment will involve consideration of other nearby DTV allotments and existing NTSC stations. We noted that any plan that provides all eligible broadcasters with a new DTV allotment will unavoidably result in some degree of interference to both NTSC and DTV stations. This is true whether the digital frequencies are distributed throughout the existing broadcast spectrum or whether the digital frequencies are generally placed in the spectrum at channels 7-51.¹⁴⁹ In the Sixth Further Notice, we proposed to allot DTV channels using an approach that is neutral in protecting both existing NTSC stations and new DTV allotments. The draft Table therefore attempted to minimize interference to all stations and to balance unavoidable interference among NTSC and DTV stations equally. We also asked questions about how to mitigate interference to NTSC service.

86. Comments. AAPTS supports our proposal to employ a neutral approach in protecting NTSC and DTV stations from interference.¹⁵⁰ It also states that we should take the additional step of requiring DTV stations to operate at reduced power where necessary to protect NTSC stations from interference during the transition. AAPTS argues that broadcast stations, which must compete with many other video distributors, cannot afford to alienate a substantial portion of their viewers by suddenly delivering a deteriorated level of NTSC service. Joint Broadcasters maintain their longstanding position that the DTV allotment process should attempt to reduce interference to NTSC service to the maximum degree possible, in order to avoid disenfranchising viewers.¹⁵¹ On the other hand, BET supports our earlier proposal to provide a relative preference to new DTV operations when a choice must be made between providing greater service area for a new DTV allotment or minimizing interference to an existing NTSC station. It states that maximizing a DTV station's service area will result in rapid, comprehensive DTV overage, thereby encouraging the transition to

¹⁴⁹ The total amount of interference to NTSC service is primarily a function of full accommodation, *i.e.*, our goal of providing all existing stations with a companion DTV operation. Because all TV channels are used when necessary to avoid interference, there is, in general, very little impact on total NTSC interference from our spectrum recovery proposals. That is, a full accommodation approach that used all channels and did not attempt any spectrum recovery would still result in about the same level of additional interference to NTSC service areas.

¹⁵⁰ AAPTS comments, pp. 27-28.

¹⁵¹ Joint Broadcasters comments, p. 5.

DTV.¹⁵² Other commenting parties did not address this issue.

87. Decision. We believe it is important that our approach for development of DTV allotments minimize the amount of interference that would be caused to both existing TV service as well as the new DTV service. It is important to protect the existing NTSC service in designing the DTV Table so that the public does not lose television service during the transition. At the same time, we believe it is equally important to avoid interference to new DTV stations wherever possible in order to provide for the best possible DTV service in the future. We therefore have attempted to minimize interference to all stations and to balance unavoidable interference between both NTSC and DTV stations equally in developing the DTV Table of Allotments. The DTV Table we are adopting today will fully protect 98.8 percent of existing geographic service area and 98.6 percent of the population now served within the Grade B contours of existing stations. At the same time, the service replication allotment approach we are using and the superior performance characteristics of the ATSC DTV system have allowed us to provide for DTV coverage that is equal or superior in coverage to today's NTSC service. We also find that the DTV Table sufficiently minimizes interference among stations such that it is not necessary to adopt special provisions to mitigate interference during the transition.

E. Assignment Methodology

88. In the Sixth Further Notice, we proposed to assign DTV channels to eligible broadcasters in a manner consistent with our plan to employ service replication in developing the DTV Table of Allotments. We therefore proposed to designate DTV channels for existing stations based on the results of the matching process that is an intrinsic feature of the service replication approach used in developing the Table. We also requested comment on whether a first-come/first-served or some other approach for assigning channels would better meet our goal of implementing digital television in an efficient, effective manner.

89. Comments. The commenting parties addressing this issue support our proposal to assign channels to existing broadcasters based on the matching process involved in replicating the service areas of those stations. For example, the Joint Broadcasters submit that an assignment method based on replication of service areas provides the greatest opportunity for an orderly and successful transition to the digital environment.¹⁵³ They state that replication of a station's service area will maintain viewer continuity. APTS also specifically endorses the paired channel approach. It states that the pairing of channels will avoid the "first-come/first serve" spectrum free-for-all that would place noncommercial stations at a severe disadvantage to their counterparts.¹⁵⁴

¹⁵² BET comments, p. 8.

¹⁵³ Joint Broadcasters comments, p. 12.

¹⁵⁴ APTS comments, p. 3.

90. Decision. We continue to believe that the most advantageous approach for assignment of DTV channels is to match stations with the channel that best replicates their existing service areas. We agree with the commenting parties that this approach will preserve both viewers' access to the existing stations in their market and stations' access to their existing populations of viewers, and thereby ensure an orderly transition to DTV service for both commercial and noncommercial stations. Accordingly, we are offering eligible broadcasters DTV assignments in accordance with the matched plan of DTV allotments specified on the DTV Table set forth in Appendix B. These assignments will be offered to eligible broadcasters pursuant to the schedules and conditions established in our Fifth Report and Order in this proceeding.

F. Additional Considerations

91. In the Sixth Further Notice, we observed that during the transition, in most communities, digital allotments will use up all of the available spectrum for full service broadcasting. But in some communities -- mainly rural areas -- unused channels may remain even after all existing broadcasters receive allotments.¹⁵⁵ Assuming that some channels will be vacant in certain geographic areas during the transition, and more after the transition, we requested comment on whether and how we should make those channels available. We asked, for example, if once we have identified any remaining channels, we should accept applications for new primary stations? Or should we consider other possibilities, such as permitting existing broadcasters, either individually or jointly, to use the available channel or channels for additional broadcast or subscription programming? We also asked whether we should permit broadcasters in a community to propose, as an alternative to the allotment plan in the attached Table, an allotment plan that would allow them to use, jointly or individually, more than one vacant channel apiece? We asked whether we would be required in this situation to consider other mutually exclusive applications?¹⁵⁶ We further requested comment on whether, if we permit such proposals, should the channels be used on a primary or secondary basis? Finally, we asked that if we adopt the core spectrum approach, should our policies depend on whether the spectrum at issue is inside or outside the core? We also asked that in evaluating allotment plans for DTV, commenting parties consider the costs and

¹⁵⁵ For example, in Bangor/Orono, Maine, currently there are four NTSC stations. The attached DTV Table of Allotments provides DTV allotments for these four stations. However, even considering LPTV and TV translator operations, there appears to be sufficient spectrum in this area to operate a number of additional channels, either NTSC or DTV. In addition, after the transition, additional spectrum will be available when NTSC stations cease operating.

¹⁵⁶ See Ashbacker Radio Corp. v. FCC, 326 U.S. 327 (1945). In Ashbacker, the Supreme Court held that the Commission is required under Section 309 of the Communications Act, 47 U.S.C. to give consideration to all bona fide mutually exclusive applications. In so holding, the Court did not, however, preclude the Commission from establishing threshold qualification standards that must be met before applicants are entitled to comparative consideration. Indeed, in United States v. Storer Broadcasting Co., 351 U.S. 192 (1956), the Court held that, in the context of a rule making proceeding, the Commission may establish eligibility standards that applicants must meet in order to receive comparative consideration. See also Fourth Further Notice, at para. 29.

benefits under alternative approaches to spectrum recovery. We requested comment on the affect such approaches would have on new entry to broadcasting.

92. Comments. Several parties responded to our inquiries with regard to these issues. WB, for example, submits that we should assign DTV channels to NTSC broadcasters currently not eligible for a DTV channel (non-eligible broadcasters) on a priority basis if spectrum is or becomes available.¹⁵⁷ It urges that we make vacant channels available to non-eligible NTSC licensees and permittees both during and after the transition. WB also states that to the extent that an additional channel does not become available or if a non-eligible broadcaster wishes to keep its existing channel, we should allow that broadcaster to convert its existing channel to DTV operation. It further submits that wherever feasible we should make new DTV allotments available to non-eligible broadcasters at the same time channels are made available to eligible broadcasters. It states that this would facilitate a smooth transition of all broadcasters from NTSC to DTV service and thereby foster diversity.

93. CSEF argues that we should not permit existing broadcasters to have the exclusive right to use any vacant channels that might be available after the DTV assignments have been made. It states that to do so would be contrary to our goals of competition and diversity, and would run afoul of the Supreme Court's holding in Ashbacker.¹⁵⁸ CSEF submits that broadcasters should not be given more free spectrum than they will already receive through the proposed assignment of a second DTV channel. It states that it would be more appropriate to make this spectrum available to displaced low power TV stations, to mutually exclusive applicants, or, if Congress permits, to competitive bidders and/or for flexible use.

94. BET urges that we provide measures to compensate for the effects of the freeze on new broadcast applications, mega-mergers, and the loss of LPTV stations to promote diversity in media ownership.¹⁵⁹ It argues that although the Telecommunications Act of 1996 requires that we provide the initial allotment of DTV channels to incumbent full service broadcast licensees, we must also take steps promote distribution of DTV broadcast licenses to new entrants under Section 307 of the Communications Act.¹⁶⁰ In this regard, BET submits that we should make all vacant DTV allotments available to new entrants via auction following adoption of the DTV Table of Allotments for all full service broadcasters. It further recommends that we: 1) adopt rules that promote partnerships, joint ventures, and local marketing arrangements between TV broadcasters and minority- and women-owned

¹⁵⁷ WB comments, p. 13-14.

¹⁵⁸ CSEF comments, pp. 2 and 5.

¹⁵⁹ BET comments, pp. 5-7 and 10.

¹⁶⁰ See § 336(a)(1) of the Communications Act, 47 U.S.C. 336(a)(1), enacted in the Telecommunications Act of 1996; and 47 U.S.C. § 307(b).

businesses, 2) allow geographic partitioning and spectrum disaggregation for ancillary and supplementary services, and 3) provide for early recovery and auction of spectrum for new entrants. BET suggests that we adopt rules that encourage LPTV, TV translator and noncommercial operators to form partnerships with new entrants. BET also states that the revenues from supplementary/ancillary DTV services could provide incentives for noncommercial/new entrant partnerships and additional funding for noncommercial broadcast DTV operations. It urges that we encourage partnerships between incumbent television broadcasters and new entrants, particularly minority- and women-owned entities, by requiring incumbent broadcasters who are assigned DTV licenses to form partnerships with minority and women-owned entrants as a condition for the flexibility to provide supplementary services.

95. Decision. We concur with the commenting parties that it is important to continue to foster our longstanding broadcast policy goals of diversity and encouraging new entry, particularly by minorities and women. We also believe that fostering these goals is consistent with our spectrum management responsibilities to ensure that the DTV spectrum is used efficiently. Accordingly, we will permit unused DTV spectrum to be used by both new and displaced LPTV and TV translator stations. We will also allow new entrants and non-eligible broadcasters to seek and apply for new DTV allotments.¹⁶¹ In addition, as suggested by WB, we will allow non-eligible broadcasters to convert their existing NTSC operations to DTV service at any time during the transition, provided those operations are within the core spectrum area. We believe that this action will further our diversity goals and promote the development and expansion of new networks. We further encourage incumbent broadcasters to seek partnerships with new entrants in developing new stations in areas where additional unused spectrum may be available.¹⁶²

IV. OTHER ISSUES

96. In addition to the principles and objectives discussed above, there are several other matters that need to be resolved in developing the DTV Table of Allotments. These matters include use of existing transmitter sites for DTV service, treatment of vacant NTSC allotments, displacement of low power TV stations and TV translators, use of TV channels 3, 4 and 6, and protection of land mobile services. These matters are addressed below.

A. Use of Existing Transmitter Sites

¹⁶¹ We intend to give particular consideration to those parties who had applications for a construction permit on file as of October 24, 1991, who are ultimately awarded a full-service broadcast station license, given the reliance that these parties may have placed on the scheme we established before passage of the Telecomm Act. See Fourth Further Notice, at 10544-45.

¹⁶² For example, in markets such as Bangor/Orono, ME, as discussed above.

97. In the Sixth Further Notice, we proposed to allot DTV channels on the basis of current transmitter sites, rather than community reference points. Under this proposal, the current NTSC transmitter sites would be used to develop the DTV Table and to determine whether DTV allotments met the proposed minimum allotment requirements. In recognition of the fact that many broadcasters will not be able to locate their DTV operations at the same exact site as their NTSC station, we proposed to permit a broadcaster to locate its DTV facility at any site within a three-mile radius of the actual transmitter location, so long as the station would continue to serve its community of license.¹⁶³ We also proposed to permit a licensee to operate its DTV station at a site different from that of its NTSC operation where the alternate site would meet the proposed DTV minimum spacing requirements and the station would continue to serve its community of license. We noted that such site relocations could include movement to a common local TV transmission site. We also requested comment regarding any circumstances where it might be desirable to evaluate DTV allotments on the basis of sites other than those occupied by existing TV stations.

98. Comments. Most of the commenting parties who address this issue support our proposal to allot DTV channels on the basis of stations' current transmitter sites.¹⁶⁴ For example, the Joint Broadcasters and AAPTS note that this strategy will facilitate replication of NTSC service areas, thereby assuring continued service to viewers and minimizing disruption during the transition, and encourage co-location of NTSC and DTV operations.¹⁶⁵ AAPTS also states that co-location of NTSC and DTV facilities will permit stations to realize cost savings both in converting to DTV service and in operating dual facilities during the transition.

99. Freedom Communications, Inc. (Freedom), however, opposes allotment of DTV channels based on stations' existing transmitter sites. It contends that using existing transmitter sites will perpetuate current inequities of the current NTSC Table in cases where there is short-spacing to other stations and/or where transmitter sites are located away from a main local antenna farm, so that most viewers' antennas tend to be oriented away from the station's transmitter.¹⁶⁶ KSCI-TV and the LABCTS support co-location of all DTV transmitters within a market to a common site.¹⁶⁷ They state that a common transmitter site would help reduce interference, provide more available channels and eliminate receiving

¹⁶³ Such site relocations could include movement to a common local TV transmitter site, provided the new common site is within three miles of the station's existing site and would allow the station to serve its community of license.

¹⁶⁴ Parties supporting this proposal include AAPTS, Aries, the Joint Broadcasters, KSCI-TV, Pappas, Sunbelt, TV-52, and Mr. Smith.

¹⁶⁵ Joint Broadcasters comments, p. 13; AAPTS comments, pp. 4-5.

¹⁶⁶ Freedom comments, pp. 2-4.

¹⁶⁷ KSCI-TV comments, pp. 2-3; LABCTS comments, pp. 2-3.

antenna orientation problems. KSCI-TV also submits that if a station moves its transmitter to a different site which is co-located with the other stations in the market, the station should be allowed to use repeaters to provide service to areas currently served that would not be served from the new site.

100. The Joint Broadcasters oppose our proposal to allow a station to locate its DTV facility at any site within a three-mile radius of its NTSC transmitter. While they support our recognition of the need to provide broadcasters flexibility in locating their DTV operations, they are concerned that any decision to choose a different transmitter site, even one as close as one mile away, may significantly affect other stations. Broadcasters therefore believe that relocations should be considered on a case-by-case basis and recommend that this task be assigned to the proposed industry coordinating committees. They further state that requests for DTV transmitter relocation should be granted freely.¹⁶⁸

101. Aries, Sarkes Tarzian, Inc., Sunbelt, and TV-52 submit that stations need greater flexibility to locate their DTV transmitters than the three-mile radius proposed in the Sixth Further Notice. For example, Sarkes Tarzian supports allowing licensees the flexibility to operate their DTV service from locations at other than their NTSC transmitter site where such operation would not create unacceptable new interference to either the DTV or NTSC service of other stations. It submits that this approach would result in significant maximization of DTV service and better NTSC/DTV matching.¹⁶⁹ TV-52 submits that greater flexibility in locating DTV transmitter sites may be needed given the difficulty inherent in locating existing tower space or in constructing new towers.¹⁷⁰ It further states that if we grant authority to a licensee to relocate its authorized NTSC site, its DTV site should be relocated as well, even if the move would require a change of the DTV allotment. Sunbelt asks that we be flexible in permitting waivers or variations where the circumstances warrant choice of a different location.¹⁷¹

102. Decision. Given our decision on service replication, we continue to believe that DTV allotments should be based on current transmitter sites, rather than community references. We also find that allowing broadcasters the flexibility to locate their transmitting facilities at any site within a three mile radius of their existing antenna site coordinates is appropriate. Accordingly, we adopt these proposals. While we understand the concern of those commenting parties who suggest that permitting such location flexibility may impact the operations of other stations, we also recognize that existing transmitter sites may not always be available and that use of alternative sites must be accommodated to permit DTV

¹⁶⁸ Joint Broadcasters comments, p. 14.

¹⁶⁹ Sarkes Tarzian comments, p. 2.

¹⁷⁰ TV-52 comments, p. 2.

¹⁷¹ Sunbelt comments, pp. 5-6.

operations. We further believe that the impact of allowing stations to move their transmitter sites within a three mile area should be minimal, providing existing antenna patterns are maintained, and can be taken into account through minor adjustments in power and antenna height if problems arise. We also agree with those parties who suggest that we should provide as much flexibility as possible with regard to changes in transmitter locations. To provide broadcasters' flexibility, we will allow stations to relocate to other locations or co-locate their facilities with other broadcasters where such relocations and co-locations would not increase interference.¹⁷²

B. Existing Vacant Allotments, New NTSC Applications and Station Modifications

103. In the Sixth Further Notice, we proposed to eliminate all vacant NTSC allotments to facilitate development of the DTV Table. We also requested comment on whether allotments for noncommercial service deserve special consideration.

104. Consistent with our proposal to eliminate all existing vacant NTSC allotments, we stated that we would not accept additional applications for new NTSC stations that are filed after 30 days from the publication of the Sixth Further Notice in the Federal Register.¹⁷³ We stated that as we process the applications on file now and those that are filed before the end of this filing opportunity, we would continue our current policy of considering requests for waiver of our 1987 freeze Order on a case-by-case basis.¹⁷⁴ We also stated that when applications for new stations are accepted for filing, we would continue our process of issuing Public Notices that "cut-off" the opportunity for filing competing, mutually-exclusive applications. In connection with these cut-off notices, we stated that we would allow additional competing applications to be filed after the end of this filing opportunity. We anticipated that these applications for new NTSC TV stations on existing allotments will not have a significant negative impact on the development of the DTV Table of Allotments, but reserved the right, in specific cases, to determine that the public interest is better served if they are not granted, granted only if amended to specify reduced facilities, or granted only with a condition that limits the interference that the station would be allowed to cause.

105. We also stated that, effective as of the close of business on the date of adoption of the Sixth Further Notice, i.e., July 25, 1996, we would no longer accept petitions for rule making proposing to amend the existing TV Table of Allotments in Section 73.606(b) of our

¹⁷² See for example, paragraph 32, above.

¹⁷³ See Sixth Further Notice, at para. 60. Under this decision, the last day for filing of applications for new NTSC stations that would use an existing vacant allotment was September 20, 1996.

¹⁷⁴ Since July 1987, it has been the Commission's policy not to accept applications for any new stations in 30 major markets. See Order, RM-5811 (Mimeo No. 4074, released July 17, 1987).

rules to add an allotment for a new NTSC station.¹⁷⁵ We indicated that other petitions to amend the TV Table of Allotments (for example, proposing to change a station's community of license or altering the channel on which it operates, including changes in which channel allotment in a community is reserved for noncommercial educational use) could continue to be filed, but any such changes to the TV Table that include a modification of a station's authorization would be conditioned on the outcome of this DTV rule making proceeding. We stated that any petitions that were on file and any rule making proceedings that were open would be addressed on a case-by-case basis, taking into account their impact on the draft DTV Table. For those pending cases in which a new NTSC channel is allotted, we indicated that we would make an exception to our decision to cease accepting applications for new NTSC stations, and that the accompanying allotment Report and Order would specify the period of time for filing applications.

106. We stated that we would continue to permit the filing of applications by existing or authorized NTSC TV stations to modify their technical facilities, *i.e.*, maximum effective radiated power (ERP), antenna height above average terrain (HAAT), and transmitter locations. However, in order to preserve our ability to develop the DTV Table, we stated that we would henceforth condition the grant of applications for modifications of technical facilities, including those for applications on file before the date of the adoption of the Sixth Further Notice, but granted after that date, on the outcome of our final decision on the DTV Table of Allotments. We indicated that to the extent that an existing station's service or potential for causing interference are extended into new areas by grant of an application, the condition may require the station's authorized facilities to be reduced or modified. We sought comment on whether this condition should involve different consequences for applications for modifications on file as of the date of adoption of the Sixth Further Notice, as opposed to such applications filed after that date.

107. Comments. The commenting parties support our proposal to eliminate vacant NTSC allotments. These parties agree that recovery of the vacant commercial NTSC allotments is necessary to facilitate the creation of new DTV allotments.¹⁷⁶ For example, the Joint Broadcasters state that we should use unassigned/unallotted NTSC channels to increase new service while protecting NTSC and predicted DTV service.¹⁷⁷ BET submits that provision of a DTV channel for a vacant NTSC commercial or noncommercial allotment is not the most efficient use of the spectrum and suggests that such vacant allotments be recovered and made part of an auction to new entrants for DTV and other supplementary and

¹⁷⁵ See Sixth Further Notice, at para. 61, and 47 CFR §73.606(b).

¹⁷⁶ The parties that specifically support the elimination of vacant NTSC allotments include the Joint Broadcasters, Meredith, SHBC, LA County and BET.

¹⁷⁷ Joint Broadcasters comments, p. 48.

other services.¹⁷⁸ LA County and LeSEA state that elimination of the existing vacant commercial and noncommercial NTSC allotments would allow us to maximize the number of DTV allotments for existing stations in both the commercial and noncommercial services and more effectively free-up spectrum for new uses.¹⁷⁹ SHBC submits that vacant channels should be deleted if they prevent a DTV channels from being assigned elsewhere in a market.¹⁸⁰

108. APTS, the Joint Broadcasters, and Rural ask that we take steps to protect vacant noncommercial allotments. APTS and Rural argue that maintaining public broadcasting capacity is a bedrock Congressional and Commission policy that should not lightly be cast aside. The Joint Broadcasters state that they have long recognized the importance of preserving noncommercial vacant allotments in the DTV world.¹⁸¹ APTS states that we should not delete vacant noncommercial channels unless we find on the basis of an engineering analysis that there is no other way to accommodate existing broadcasters with DTV channels.¹⁸² APTS states that it often takes years to lay the ground work for a noncommercial application, and that it would be unjust if we were to reallocate a vacant reserved NTSC channel for DTV service at the eleventh hour and deny an application to use that channel for noncommercial service. It states that we should be particularly careful to protect vacant reserved noncommercial NTSC channels in cases where a party has already applied for the channel during the filing period that closed on September 20, 1996. APTS and the Joint Broadcasters also submit that we should replace any deleted noncommercial NTSC channels with noncommercial DTV channels, where possible, and that we should pair DTV channels with vacant NTSC channels. It further submits that we should replace the rest of the vacant channels that we delete with digital channels reserved for noncommercial use when analog channels are returned at the end of the transition.

109. Many of the commenting parties address our decision to place a condition on modifications of facilities granted after the adoption of the Sixth Further Notice.¹⁸³ APTS and the Joint Broadcasters support this decision. They submit that in processing such applications, we should determine whether the proposed change would cause new interference

¹⁷⁸ BET comments, p. 10.

¹⁷⁹ LA County comments, p. 8; LeSEA comments, p. 5.

¹⁸⁰ SHBC comments, p. 4.

¹⁸¹ Joint Broadcasters comments, p. 53. They also submit that their Modified Table would replace some of the noncommercial vacant NTSC allotments with DTV equivalents.

¹⁸² APTS comments, pp. 19-24; Rural comments, pp. 2-3.

¹⁸³ Parties addressing our decision to apply a condition to facility modifications include APTS, the Joint Broadcasters, Costa, Crossville, Maranatha, the Modifiers, Media Properties, Inc. (Media), MVM, Meredith Corporation (Meredith), Pulitzer Broadcasting Company (Pulitzer), Ramar, Red River, Second Generation, Sonshine, and Valley.

to the protected service of any new DTV channel.¹⁸⁴ Most of the parties addressing this issue argue that we should not condition facility modifications in cases where the application was submitted prior to the adoption of the Sixth Further Notice.¹⁸⁵ For example, MVM argues that conditioning grant of pre-existing modification applications on the outcome of the DTV allotment proceedings would penalize broadcasters who improve their service to the public. It states that few if any licensees would spend money in the improvement of service if the public and financial benefits of that improved service would be lost or compromised upon implementation of the DTV Table. The Modifiers argue that because of the condition, communities that now receive service from a modified NTSC stations may lose that service during the transition.¹⁸⁶ They further submit that the applications for modification filed for before the adoption of the Sixth Further Notice were developed as a routine part of the business of providing and improving current television service to viewers. The Modifiers also argue that the applicants did not cause the delays in granting their own applications. The Modifiers further submit that with the advent of the fledgling UPN and WB networks, a substantial number of independent stations that either were not built or were operating with inferior facilities have now found the resources to upgrade their facilities. They argue that these stations should not be held to that inferior status in the digital environment.

110. Pulitzer Broadcasting Company (Pulitzer) argues that many applicants relied on our previous decision, in the Second Further Notice, not to restrict modifications in preparing and filing their pending modification applications and that these parties would be unfairly prejudiced by this reversal.¹⁸⁷ It also notes that some older applications remain pending, while other applications, filed more recently, have been granted. Pulitzer states that each pending application should be considered on a case by case basis to determine whether the factual and legal circumstances warrant application of this new policy. It also argues that applications for modification filed after July 25, 1996, have less of a claim of prejudice because they undertook the investment in the facilities changes with full knowledge of the uncertainties that might stem from this proceeding.¹⁸⁸

111. WB states that because new networks have acute need for additional affiliates now, it urges us to consider and act on all pending applications and rule makings for new

¹⁸⁴ APTS comments, p. 43; Joint Broadcasters comments, p. 49.

¹⁸⁵ The parties arguing that we should not condition modifications grants where the application was filed before July 25, 1996, include Costa, Crossville, Maranatha, the Modifiers, Media Properties, Inc. (Media), MVM, Meredith Corporation (Meredith), Pulitzer Broadcasting Company (Pulitzer), Ramar, Red River, Second Generation, Sonshine, Valley, and WB.

¹⁸⁶ The Modifiers comments, pp. 5 and 9.

¹⁸⁷ See Second Further Notice, at para. 38.

¹⁸⁸ Pulitzer comments, p. 8.

NTSC stations before we allot DTV channels for eligible broadcasters.¹⁸⁹ It argues that we should not sacrifice diversity of over-the-air television in the process of implementing DTV service and that we should consider the role that networks play in promoting programming and ownership diversity. CBA argues that waivers and new applications should not be granted until a specific effort has been made to minimize damage to LPTV.¹⁹⁰ Meredith agrees we should freeze new facilities.¹⁹¹

112. Decision. As we stated in the Sixth Further Notice, eliminating existing vacant NTSC allotments will help us better achieve our goals of full accommodation, service area replication and spectrum recovery in the development of DTV allotments. If vacant allotments were retained, it would not be possible to accommodate all existing broadcasters in some areas and the expected service areas of many of the DTV allotments would be reduced. Such crowding could also result in increased interference to existing NTSC stations. Moreover, we believe that new television broadcast stations should operate with the new DTV technology. In this regard, the licensing of new NTSC stations will come to an end as provided in the Sixth Further Notice. Thus, there is no need to maintain vacant NTSC allotments that are not the subject of a pending application or rule making proceeding. Accordingly, as proposed, we are deleting all existing vacant NTSC allotments.¹⁹² With regard to noncommercial vacant allotments, the DTV Table replaces existing vacant noncommercial NTSC allotments with new noncommercial reserved DTV allotments where feasible, in a manner similar to the approach suggested by the Joint Broadcasters. After the transition, we also will consider establishing additional noncommercial reserved allotments on recovered spectrum for those existing vacant noncommercial allotments that cannot be replaced at this time. Consistent with our policy stated in the Sixth Further Notice with regard to pending applications and petitions for rule making requesting new allotments, we will maintain and protect those vacant NTSC allotments that are the subject of pending applications and will avoid creating DTV allotments that would conflict with proposed new NTSC allotments. This will ensure that parties who have already begun to invest in new stations, including those planning noncommercial stations, may continue to pursue their ongoing station development projects.

¹⁸⁹ WB comments, p. 8.

¹⁹⁰ CBA comments, p. 18.

¹⁹¹ Meredith comments, pp. 14-15.

¹⁹² In order to allow us the opportunity to identify and resolve all cases where there are pending requests to use existing vacant allotments, we are not implementing the deletion of vacant allotments in the rule amendments set forth in Appendix E of this Report and Order. We will eliminate the vacant NTSC allotments from Section 73.606 of the rules, 47 CFR § 73.606, in a separate Order at an appropriate time in the future. Nonetheless, we will henceforth treat the existing vacant allotments that are not the subject of pending applications as deleted and, consistent with our decision in the Sixth Further Notice not to accept applications for new NTSC stations after September 20, 1996 (see above), will not accept new applications for new stations on those allotments.

113. In developing the DTV Table of Allotments, we have been able to accommodate all of the eligible broadcasters with DTV allotments that would not conflict with any of the authorizations to modify existing NTSC facilities that have been granted subsequent to July, 25, 1996. Accordingly, we are removing the condition from all such authorizations to modify existing NTSC facilities. Henceforth, we will consider any impact on DTV allotments in deciding whether to grant applications for modification of NTSC facilities.

C. Low Power and TV Translator Stations

114. In the Sixth Further Notice, we recognized the benefits that low power stations provide to the public. We therefore indicated that we would attempt to minimize the impact of our DTV allotment and spectrum recovery proposals on low power TV operations. We proposed a number of measures for mitigating the impact on low power stations. First, in keeping with the decisions made in the Second Report/Further Notice, we reiterated our proposal to continue to permit displaced low power stations to apply for a suitable replacement channel in the same area without being subject to competing applications.¹⁹³ In this regard, we noted that many current TV channels have fewer than 100 LPTV or TV translator stations nationwide, while many other channels have significantly more than 100 such stations. We therefore stated that with more intensive utilization of the remaining channels, it should be possible to accommodate many LPTV and TV translator operations that are displaced. We stated that we would extend this relief measure to LPTV and TV translator licensees and permittees whose facilities are predicted to conflict with a DTV station. To insure the most effective use of this policy, we proposed to permit applications for such "displacement" relief to be filed at such time as there would be a reasonable expectation of displacement; for example, upon the filing of an application by a full service broadcaster for a DTV channel that would conflict with operation of the LPTV or TV translator station. We proposed to permit low power stations to operate until a displacing DTV station or a new primary service provider is operational. We also proposed to permit low power stations to file non-window displacement relief applications to change their operating parameters to cure or prevent interference caused to or received from a DTV station or other protected service.¹⁹⁴

115. We further proposed to permit low power TV operations on existing TV channels outside the core digital TV spectrum area. Under this proposal, low power TV

¹⁹³ See Second Report/Further Notice, at para. 45. The rules now permit special relief for authorized stations in the LPTV service having an actual or predicted interference conflict with a TV broadcast station or protected land mobile radio service. In that event, a station licensee or permittee may immediately file an application for a change in output channel, together with other changes necessary to avoid interference. Provided, such an application is acceptable for filing, it may be granted without opportunity for the filing of competing applications. See 47 CFR. 73.3572.

¹⁹⁴ LPTV and TV translator stations would be allowed to continue to operate provided they protected full service DTV operations in accordance with the desired-to-undesired signal ratios used for modifications to the DTV Table of Allotments.

operations on out-of-core channels would continue to be on a secondary basis and would have to avoid interference to any full service DTV or NTSC stations or to any new primary service operations. We requested comment on whether new service providers displacing low power stations should be required to compensate the licensees of those stations for their investment or for their move to another channel if such a move is possible.

116. We indicated that despite the above measures, a number of LPTV stations would still be required to cease operation in order to avoid interference to new DTV channels. We therefore sought to explore other policies that would preserve access to LPTV programming. We asked whether there are ways for low power stations to obtain carriage on new DTV stations or other video distributors. For example, in view of the ATSC DTV system's multiple programming capability, we asked whether we should consider incentives to encourage full-service digital stations to find ways to accommodate LPTV and TV translator stations? Similarly, we asked whether we should consider incentives to encourage carriage of LPTV stations on cable systems beyond the requirements set forth in Section 614(c) of the Communications Act?

117. We sought comment on any and all means of lessening the impact on low power TV and TV translator stations. In so doing, we invited the LPTV and TV translator communities to identify workable means of preserving existing LPTV service to the extent possible and of providing a digital migration path for LPTV and TV translator stations. We asked whether, if we were to adopt our core spectrum proposal, we should also set aside a few frequencies between channels 52 and 59 specifically for use by displaced LPTV stations. We requested comment on other possibilities, such as permitting existing broadcasters, either individually or jointly, to use the available channel or channels for additional broadcast or subscription programming. We asked, for example, if once we have identified any remaining channels, we should create a new class of primary LPTV and TV translator stations?

118. In the Sixth Further Notice, we observed that currently the rules do not permit low power and TV translator stations to operate on certain channels within specified distances of full service stations.¹⁹⁵ For example, a UHF low power or TV translator station is not permitted to operate on a channel that is seven channels above a full service station unless the low power station is located 100 kilometers or more from that station. There are similar restrictions for other UHF channels. While these rules are intended to protect against interference, in many instances interference would not occur between stations operating at closer distances due to terrain or other factors. The current LPTV interference protection rules do not allow for terrain shielding and other mechanisms, such as co-location of adjacent channel stations. We do, however, permit applicants for LPTV and TV translator stations to

¹⁹⁵ See Section 74.705 of the rules, 47 CFR §74.705.

request a waiver of the rules to take terrain shielding and other mechanisms into account.¹⁹⁶ In order to provide low power operations with additional flexibility, we proposed to allow any low power operation that is adversely affected by the implementation of DTV or our spectrum recovery efforts to take terrain and other appropriate engineering factors into account in finding replacement channels. We proposed to permit such low power stations to use any available channel, provided interference is not caused to any authorized full service NTSC or DTV operations or to other authorized low power operations. Under this plan, applications that would rely on terrain shielding to avoid interference would need to be supported by the written assent of the operator of the potentially affected station or service or, alternatively, an engineering analysis showing that interference to the off-air reception of the DTV station or other primary service would not be likely due to terrain shielding. We also requested comment on any other actions we could take that would provide low power stations with additional flexibility to find replacement channels.

119. We requested comment on whether, once DTV channels have been allotted to full service television broadcasters, we should afford licensed LPTV stations a window of opportunity to seek "primary" use of DTV channels; that is, ahead of new broadcast entrants. We asked whether if so, such stations should be permitted to seek full service DTV licenses or facilities that would replicate their LPTV coverage areas. We asked how we should proceed in areas where there would be more LPTV stations than available channels and whether we should allow multiple LPTV licensees to share a DTV channel, by multiplexing their signals. We asked whether, given the large numbers of stations in the LPTV service, we should consider such a provision only for certain LPTV stations; for example, those which meet the programming and public interest requisites for LPTV cable must carry, as set forth in the 1992 Cable Act.

120. Comments. Parties representing LPTV and TV translator interests express considerable concern with regard to the impact that the implementation of DTV service will have on their service and ask that we take a wide range of steps to avoid or reduce that impact.¹⁹⁷ These parties generally submit that low power stations provide important and valuable local and other program services oriented to minority and special interests in their

¹⁹⁶ Generally, an applicant for a low power TV or TV translator station may support a terrain waiver request by obtaining the assent of a potentially affected station or, alternatively, by submitting an engineering study, based on terrain profiles, which demonstrates that interference would not occur due to the effects of the terrain. See Commission Policy Regarding Terrain Shielding, 3 FCC Rcd 2664 (1988), *recon granted in part*, 3 FCC Rcd 7105 (Terrain Shielding Policy Statement); see also, First Report and Order in MM Docket No. 93-114, 9 FCC Rcd 2555 (1994), which broadened the scope of the LPTV terrain waiver policy.

¹⁹⁷ Parties addressing the concerns of low power stations include AAPTS, Acadiana Cable Advertising, Inc. (Acadiana), Acrodyne, ALB, Apogee, Aries, Bruno-Goodworth Network, Inc. (BGN), Joint Broadcasters, Busse Broadcasting Corp. (Busse), CBA, Channel 6, Community Teleplay, Inc. (CTI), Arnold Cruze, DSD, Holston Valley Broadcasting Corporation (HVBC), Island Broadcasting Co. (Island), KSCI-TV, KUED-TV, KYNE-TV, Lindsey, SHBC, Mr. Richard Smith, Silver King, Telemundo, Tiger Eye, UCI, the U.S. Broadcast Group Licensee, L.P.I. (USBGL), VenTech, WatchTV, and WJYL-TV.

communities that should be preserved.¹⁹⁸ UCI states that because of the lower cost of building and operating LPTV stations, as well as the fact that they were the only option available to minority programmers in many markets, a disproportionately high percentage of minority programming is carried on LPTV stations. It states that these services would be lost if LPTV stations are displaced.¹⁹⁹ AAPTS specifically asks that we take steps to ameliorate the impact of DTV allocations on noncommercial translator service.²⁰⁰

121. In a March 6, 1997, letter to Chairman Hundt, 53 members of the United States Senate also urge that we address the interests of LPTV and TV translator stations.²⁰¹ The Senators, *inter alia*, encourage us to make more efficient use of the spectrum and eliminate current technical restrictions such as the UHF taboos in order to reduce the impact on low power operations.

122. Low power interests generally support our proposal to allow low power stations that are displaced by new DTV stations to apply for a suitable replacement channel in the same area without being subject to competing applications.²⁰² For example, CBA supports liberal displacement relief for LPTV stations by permitting them to apply for any other available channel on a first come first served basis, without waiting for an application filing window.²⁰³ The DSD submits that we should allow low power stations to change channels through minor, rather than major, change procedures.²⁰⁴ Under DSD's plan, channel changes could be made with FCC notification and a 30-day publication requirement. Applicants would be required to certify that they has performed a channel availability study prior to filing. The DSD states that this change, while it would not obviate the costs of modifying equipment and installation of a new antenna, would go far to alleviate the impact on these services generally. Acadiana and Busse, however, submit that allowing low power stations to apply for replacement channels is not satisfactory means for ameliorating the DTV impact on

¹⁹⁸ See for example, comments of CBA, p. 1; Channel 6, p. 2-3; UCI, pp. 6-7; and USBGL, p. 5.

¹⁹⁹ UCI comments, pp. 6-7.

²⁰⁰ AAPTS comments, p. 40.

²⁰¹ See Letter, dated March 6, 1997, to Honorable Reed E. Hundt, Chairman, Federal Communications Commission from Senator Wendell H. Ford, *et. al.*

²⁰² The parties that specifically express support for allowing low power stations to apply for replacement channels without being subject to competing applications include Busse, CBA, CTI, DSD, KSCI-TV, KULC-TV, Silver King, Telemundo, UCI, and VenTech.

²⁰³ CBA comments, p. 14.

²⁰⁴ DSD comments, pp. 10-11.

these stations.²⁰⁵ They argue that low power stations, as the least affluent members of the broadcast community, are the most poorly equipped to undertake the expense and engineering study involved in searching for unoccupied space in a shrinking spectrum environment.

123. APTS, Channel 6, CTI and KSCI-TV support our proposal to allow LPTV and TV translator stations to continue to operate until a new, displacing DTV station is operational on their channels.²⁰⁶ APTS, Acrodyne, CTI, and KSCI-TV state that this policy should apply to low power stations on channels both within and outside the core region. CTI also agrees that LPTV stations should be able to file non-window displacement relief applications to change their operating parameters. KUED-TV supports our proposal to permit low power stations to operate outside the DTV core spectrum. They also state that we should require television receiver manufacturers to support these channels.²⁰⁷

124. APTS states that we should require new non-broadcast users of reallocated spectrum to compensate translator and LPTV licensees that they displace for the costs those licensees incur in moving to a new channel.²⁰⁸ However, it does not believe that new DTV licensees should be required to compensate translator or LPTV licensees for moving costs since the latter constructed their facilities with the knowledge that they were secondary to full service broadcast facilities. Apogee, BGN, CBA, Channel 6, Cruze, CTI, KUED-TV and VenTech argue that a DTV licensee displacing a low power station should be required to pay for the LPTV channel change, or pay it for the lost business opportunities in the event that no channel is available. Channel 6 states that compensation would ease the transition to new channels and help to ensure the continued operation of low power service.²⁰⁹ KUED notes that most translator licensees are non-profit, do not have the funds for replacement and a new translator station can cost up to \$50,000.²¹⁰ BGN submits that LPTV stations forced off the air by reallocation of spectrum should be compensated at least one million dollars from revenues obtained through the spectrum auction.²¹¹ CBA argues that such compensation should be awarded irrespective of whether the low power stations's channel is inside or outside the core spectrum. It argues that such compensation could come from the full service station that chooses to displace the LPTV station rather than use another channel; but

²⁰⁵ Acadiana comments, pp. 5-6; Busse comments, p. 5.

²⁰⁶ APTS comments, p. 40; Channel 6 comments, p. 3; CTI comments, p. 3; KSCI-TV comments, p. 3.

²⁰⁷ KUED-TV comments, p. 7.

²⁰⁸ APTS comments, p. 40.

²⁰⁹ Channel 6 comments, p. 3.

²¹⁰ KUED-TV comments, p. 7.

²¹¹ BGN comments, pp. 5-6.

indicates that it may be more appropriate that compensation come from auction revenues.²¹²

125. AAPTS, Apogee, CBA, and VenTech submit that we should take additional steps to encourage or require cable systems to carry local LPTV stations. AAPTS argues that we should allow noncommercial TV translators, whether providing NTSC or DTV service, to qualify for carriage on cable systems under Section 615 of the Communications Act.²¹³ It states that Section 615 explicitly requires carriage of noncommercial educational translators with five watts or higher power serving a cable franchise area.²¹⁴ Apogee believes that LPTV stations that meet certain local origination, children's programming and regulatory standards should be given the benefits of "must-carry" rights.²¹⁵ CBA supports greater incentives for cable carriage of LPTV. It suggests, for example, that we permit cable operators a 20-cent subscriber rate increase in return for adding an LPTV signal and through establishing reasonable leased access channel rates.²¹⁶ VenTech states that in the event that our cable "must carry" authority survives, it would be appropriate to require all cable operators to carry LPTV stations.²¹⁷

126. Apogee submits that, as an alternative, we could require DTV operators proposing a multi-channel service to provide a replacement channel for displaced LPTV operators at a cost comparable to the LPTV station's operating costs.²¹⁸ Benton supports adoption of a plan that would provide for channel sharing in DTV broadcasting to lessen the impact on LPTV stations.²¹⁹ It states that existing LPTV stations should be afforded priority in such sharing arrangements. Benton also proposes that a channel sharing plan also include new entrants to broadcasting. SHBC believes that the rules should permit broadcasters to negotiate with LPTV and TV translator station operators for the purpose for transmitting their signal.²²⁰ It believe such arrangements could allow broadcasters to serve areas where interference cannot be avoided during the transition. On the other hand, BET opposes allocating free spectrum for LPTV and TV translator stations that have secondary status in the

²¹² CBA comments, p. 18.

²¹³ See 47 U.S.C. § 535.

²¹⁴ AAPTS comments, p. 41.

²¹⁵ Apogee comments, p. 4.

²¹⁶ CBA comments, pp. 15-16.

²¹⁷ VenTech comments, p. 8.

²¹⁸ Apogee comments, p. 4.

²¹⁹ Benton comments, p. 5.

²²⁰ SHBC comments, p. 5.

current TV licensing process.²²¹ It states that the interests of a diversity of viewpoints mandates that a wider pool of applicants be allowed to apply for new spectrum that could be used for DTV and other services.

127. Many parties representing low power television interests submit that we should provide for conversion of LPTV and TV translator stations to DTV service.²²² For example, CBA submits that LPTV stations that survive the transition should be permitted to migrate, on a permanent basis, to digital operations on any available channel where interference would not be caused, when and as they are ready to do so.²²³ CBA states that as existing service providers, these stations should be given access to available spectrum before the general public is permitted to apply. It further submits that full service broadcasters should be subject to a "use-it-or-lose-it timetable." Acadiana and Busse argue that, where feasible, we should provide each LPTV and TV translator station with a channel on the DTV Table and allow them to determine when to make the transition to DTV service.²²⁴ The DSD and Freedom similarly request that we leave the transition of low power stations to DTV service to the market.²²⁵ Freedom argues that low power stations should be under no requirement to make a transition to DTV, either having to wait for some specific opening date or to change by a specified date at the end. The DSD is concerned that the costs of transition on a fixed schedule could be more expensive that low power operators could afford. It further requests that once the DTV Table is adopted the existing freeze on low power applications should be lifted. It states that new applications should be required to demonstrate compliance with all required D/U separation criteria, and would be licensed on a secondary, non-interference basis. The DSD believes that this approach would mitigate some of the lack of new entry built in to the current proposal. Acrodyne, a manufacturer of low power and full service TV transmitters, argues that low power broadcasters should be given the opportunity to provide DTV services immediately so as to be able to compete effectively with other DTV providers in their markets.²²⁶ It states that many of the low power transmitters currently in use and being manufactured can be easily converted/modified for use with DTV signals, thereby allowing LPTV broadcasters to implement DTV service early.

128. Cruze, HVBC and Mr. Smith believe that we should reserve some channels for low power operations in order to preserve the local television service provided by these

²²¹ BET comments, p. 11.

²²² The parties addressing conversion of low power stations to DTV service include Acadiana, Acrodyne, BGN, Busse, CBA, DSD, and Freedom.

²²³ CBA comments, p. 20.

²²⁴ Acadiana comments, pp. 6-7; Busse comments, p. 7.

²²⁵ DSD comments, pp. 11-12; Freedom comments, p. 9.

²²⁶ Acrodyne comments, pp. 1-2.

stations. Cruze recommends that we preserve channels 60-69 for use by existing translators and displaced translator operations.²²⁷ HVBC suggests that we allocate perhaps four UHF channels just above the final full service TV band for the exclusive primary use of LPTV stations and the secondary use of TV translators.²²⁸ Mr. Smith supports reserving the top ten channels of the UHF band for low power service, whether it be channels 51-59 or 60-69 and states that we should allow displaced stations the first opportunity to move to these channels.²²⁹

129. Low power TV operators and others also submit that we should afford low power stations priority in access to spectrum not needed for implementation by eligible broadcasters and additional spectrum that may become available.²³⁰ For example, Apogee states that as a matter of fairness and equity, displaced LPTV operators should be given first priority in any surplus DTV channels. Apogee also argues that priority should be afforded to multi-channel DTV applicants who agree to allocate one or more channels to displaced LPTV stations.²³¹ Aries, Channel 6, CTI, UCI, Venture Technologies Group (VenTech), and WatchTV believe that we should provide a window of opportunity for LPTV and TV translator stations to seek primary status before new applicants are allowed to apply for DTV channels.²³² HVBC argues that LPTV stations that originate programming should be afforded primary status.²³³ KYNE proposes that we establish a new class of LPTV license called a "Primary Low Power TV Station" that would provide primary status to low power stations if they meet the same responsibilities and programming requirements as full service stations.²³⁴ KSCI-TV argues that channels for TV translators and on-channel repeaters should be given a priority over other low power stations.²³⁵ It states that translators are used to provide the signal of a full service station to viewers who cannot receive the full service station because of terrain factors.

²²⁷ Cruze comments, p. 2.

²²⁸ HVBC comments, p. 14.

²²⁹ Mr. Smith comments, pp. 5-6.

²³⁰ Parties that believe we should afford low power stations priority or primary status with regard to available spectrum include AAPT's, Aries, the Joint Broadcasters, Channel 6, CTI, HVBC, KSCI-TV, KYNE, UCI, VenTech, and WatchTV.

²³¹ Apogee comments, p. 4.

²³² Aries comments, p. 3; Channel 6 comments, p. 3; CTI comments, p. 5; UCI comments, p. 8; VenTech comments, pp. 3-4; WatchTV comments, pp. 2-3.

²³³ HVBC comments, p. 10.

²³⁴ KYNE comments, p. 4.

²³⁵ KSCI-TV comments, p. 3.

130. The Joint Broadcasters state that after the initial construction period, it would be appropriate to give LPTV and translator stations that were displaced from their existing channels special consideration in assigning DTV channels that are still unassigned or have not been built.²³⁶ APTS argues that we should give noncommercial translators priority in using newly available spectrum. It states that this priority should be afforded in two ways.²³⁷ First, it states that until one year after DTV stations are required to commence operation, we should make vacant noncommercial DTV channels available only for noncommercial translator service except where an applicant proposes to operate a full service noncommercial station on the channel. Second, it recommends that, for noncommercial translators that 1) provide a first noncommercial service to an area and 2) were required to cease operation as a result of the commencement of a DTV service, we provide a preference over other translator and LPTV applicants for all digital channels that become available in their service areas until one year after the end of the transition. The DSD disagrees with those who would make LPTV a primary service.²³⁸ It states that secondary status creates latitude for LPTV to take a leadership role in experimentation.

131. The commenting parties are generally supportive of our proposals to relax existing technical standards for location and operation of low power stations. They agree that the proposed technical changes would mitigate the impact of DTV operation on low power stations and ask that we adopt them as a start in preserving these stations. Several parties also submit suggestions for additional measures for affording relief to low power stations.

132. CBA, KSCI-TV, Telemundo and VenTech agree that we should allow displaced low power stations to take terrain and other appropriate engineering considerations into account in finding replacement channels. CBA submits that we should fully recognize and expand our existing policies regarding the use of directional antennas and terrain shielding as a means to avoid interference to full service stations.²³⁹ KSCI-TV states that because translators are normally located in mountainous areas, flat earth calculations are not relevant.²⁴⁰ VenTech requests that we use terrain limited contours for NTSC stations and take terrain into account when determining interference from LPTV stations to any other station.²⁴¹ CBA also states that LPTV and TV translator licensees should be able to use the same analytic methods, including Longley-Rice analysis, that we use in developing the DTV Table

²³⁶ Joint Broadcasters comments, pp. 52-53.

²³⁷ APTS comments, p. 37.

²³⁸ DSD comments, pp. 11-12.

²³⁹ CBA comments, pp. 11-13.

²⁴⁰ KSCI-TV comments, p. 4.

²⁴¹ VenTech comments, p. 10.

to show that a proposed new channel would not cause interference.²⁴² VenTech asks that in all cases where interference calculations are made to NTSC stations from LPTV stations, we assume the same receiving antenna patterns for determining the protection levels of NTSC and DTV stations.²⁴³

133. A number of parties representing low power TV interests request that we eliminate or reduce the existing rules intended to limit interference by low power stations to full service stations. CBA states that the interference requirements for low power stations are more stringent than the fixed mileage separation requirements applied between full service stations.²⁴⁴ It states that interference rules for low power stations should be conformed to the assumptions underlying the full power rules. It further submits that LPTV operators should always be allowed to accept any interference they are willing to endure. CTI submits that the criteria for controlling interference from low power stations should be the desired-to-undesired (D/U) signal ratios, as calculated from the currently licensed technical parameters of the stations involved.²⁴⁵

134. VenTech states that co-channel protection to DTV service from low power stations should be phased in over the first five years.²⁴⁶ It submits that once DTV receivers are available to the general public, DTV signals should be protected from co-channel low power stations at a contour 15 dB above the minimum DTV service contour. VenTech states that this should be phased to full contour protection within five years or when the DTV receiver population reaches a significant level, whichever is longer.

135. With regard to adjacent channel operation, Island proposes that we accept low power applications if the applicant demonstrates: 1) that the station's signal will not exceed the signal of an adjacent channel full service NTSC station by more than 15 dB in any area in which the full service station is significantly viewed over the air, and 2) the station's signal will not be more than 20 dB different in level from the signal received by another LPTV station operating on an adjacent channel in any area in which the potential victim LPTV station is, or is predicted to be, significantly viewed over-the-air.²⁴⁷ Island notes that this may require co-location, or near co-location of the LPTV station with the adjacent channel full service station and that the LPTV station would risk being overwhelmed by the full service

²⁴² CBA comments, p. 14.

²⁴³ VenTech comments, p. 10.

²⁴⁴ CBA comments, pp. 14-15.

²⁴⁵ CTI comments, p. 3.

²⁴⁶ VenTech comments, p. 12.

²⁴⁷ Island comments, p. 2.

station. CBA and Island submit that in cases where a low power NTSC station is on a channel adjacent to a DTV station, we should require the DTV station to minimize its impact on the LPTV station.²⁴⁸ They state that we should require the DTV station to cooperate with the LPTV station to make it possible to maintain the precise frequency separation of the two stations within the 6 Hz tolerance that minimizes the beat between the DTV carrier and the NTSC color subcarrier that shows up as interference in the NTSC picture. VenTech submits that, during the transition, adjacent channel interference from low power TV to DTV service can be reduced by additional filtering at the low power transmitter, and may also be treated at DTV receivers by filters or antenna changes, and so that in no case should such interference result in the termination of NTSC low power service.²⁴⁹ VenTech also proposes that we permit the use of first adjacent channels from sites within 3 km of an adjacent channel NTSC UHF station without a waiver request, providing that an analysis of signal strengths shows adequate protection of the adjacent channel NTSC station at receiver locations.

136. Low power interests, including Cruze, CTI, Island, VenTech, and WJYL-TV also ask that we eliminate the UHF taboo fixed mileage spacing standards for low power stations.²⁵⁰ These parties argue that the existing taboos are unnecessary for low power operations and should be eliminated as a means to mitigate the impact of DTV implementation on low power stations. For example, WJYL-TV submits the current mileage separations and taboos that apply to low power TV operation could be altered, based on improvements that have occurred in receiver technology and quality. It states that the taboos should be re-evaluated using modern day receiver sensitivity and rejection performance. Arnold Cruze recommends removing UHF taboos that cause minor or no interference to co-located stations. He argues that this has been proven in actual service when waivers have been granted. Island argues that our plan to establish a DTV core spectrum area places a priority on optimum use of the spectrum and that we can no longer afford blanket, super-safe UHF taboos.²⁵¹ Island argues that in cases where it can be shown to be probable that no interference will occur, we should allow a low power station to operate at its own risk. It states that reception tests in the New York City area show very little evidence of interference even though a number of violations of the UHF taboos exist among the stations operating there. VenTech submits that given their low signal levels, low power stations are unlikely to cause interference to stations on other than co- or adjacent channels.²⁵² It therefore argues

²⁴⁸ CBA comments, p. 12; Island comments, p. 2.

²⁴⁹ VenTech comments, pp. 9-12.

²⁵⁰ In addition to the co-channel and adjacent channel interference concerns, it is possible for stations operating on certain other combinations of channels, principally in the UHF band, to interfere with one another. Allotment constraints on these combinations (e.g., channels +/- 2, 3, 4, 5, 7, 8, 14, and 15) are known as UHF taboos.

²⁵¹ Island comments, p. 2.

²⁵² VenTech comments, p. 11.

that we should not employ taboo restrictions on low power stations during the transition. Lindsey states that we should allow LPTV stations to relocate to current oscillator, aural image and intermodulation channels at their own risk.

137. CBA and Island state that to encourage more efficient use of the spectrum, we should regulate low power TV stations by ERP rather than transmitter output power.²⁵³ They argue that the existing limit on total power output (TPO) unnecessarily restricts LPTV operation. Island submits that it is actually ERP that governs coverage and interference, not TPO. It states that if LPTV stations were allowed to operate with higher TPO, while held to the existing strict interference standards, they could easily, in many cases, raise their close-in received power level so that they could operate and survive co-located with adjacent channel full service stations. Island therefore requests that we accept LPTV applications where the only power specification is an ERP value in any azimuth or elevation direction that is no greater than 3 kW for low VHF, 10 kW for high VHF and 150 kW for UHF, and meets all other interference criteria then in effect and not waived.

138. KYNE and Lindsey requests that we allow LPTV stations to increase power to a level that would allow them to maintain a 15 dB signal to interference ratio with neighboring full service stations.²⁵⁴ They state that this change would significantly reduce the number of LPTV casualties during the DTV transition. Lindsey also argues that we should abolish our zero tolerance policy with regard to interference and allow reasonable interference to occur in an LPTV station's Grade B contour, as has always been allowed for full service stations. VenTech also submits that we should make allowances for LPTV stations to "provide greater interference to full service stations to preserve them in the spectrum."²⁵⁵

139. Telemundo submits that we should permit low power stations to co-locate with DTV or NTSC facilities. It states that by allowing displaced low power stations to co-locate with existing NTSC or new DTV stations, the necessary interference protection ratios can be maintained throughout the NTSC or DTV station's service area. It also states that we should permit displaced low power stations to increase power in order to serve their previous coverage areas following co-location of their facilities with an NTSC or DTV station. VenTech requests that we permit low power stations to operate within the land mobile protected contour on the adjacent channel to one of the land mobile assignments in Sec. 74.709(a) of the rules, provided that sufficient filtering is used in the LPTV transmitting system to protect the adjacent land mobile stations.²⁵⁶

²⁵³ CBA comments, pp. 11-12; Island comments, p. 6.

²⁵⁴ KYNE comments, p. 3; Lindsey comments, pp. 4-5.

²⁵⁵ VenTech comments, p. 6.

²⁵⁶ See 47 CFR § 74.709(a).

140. Several parties representing low power TV interests also argue that we should include low power stations in the computer software used to develop the DTV Table. Acadiana and Busse argues that by failing to include low power stations in the allotment software, we have failed to take the one step that might have illuminated the hazards facing low power operators.²⁵⁷ Busse states that we should modify our allotment software to include instructions such that in cases where a channel currently occupied by a low power station is required for the DTV transition, the program would look for an alternative channel for the displaced station. Acadiana and Busse also state that inclusion of low stations in the computer software would allow us to furnish a reasonable estimate of the scope of the impact faced by LPTV and TV translator operators. Apogee states that we should redo the draft Table taking low power stations into account and protecting them wherever possible.²⁵⁸ CBA suggests the allotment software include a penalty for displacing an operating LPTV station.²⁵⁹ It recommends that where there is a conflict between LPTV and full power stations, the first attempt should be to find an alternative DTV channel for the full service station, and that one DTV channel should be deemed equivalent to another if their NTSC replication is within 5% and there are no other serious countervailing considerations.

141. Decision. In providing all full service TV stations with a second DTV channel, we have previously found that it will be necessary to displace a number of LPTV and TV translator operations, especially in the major markets.²⁶⁰ This determination was based on studies by our staff and by our Advisory Committee on Advanced Television Service (Advisory Committee) that indicate there is insufficient spectrum available in the broadcast TV bands to factor in low power displacement considerations in making DTV allotments.²⁶¹ As the Joint Broadcasters state in their comments in response to the Sixth Further Notice, during the transition there is simply not enough available spectrum to preserve all existing translators and LPTV stations.²⁶²

142. Notwithstanding our decision to maintain the secondary status of low power stations, we are concerned about the impact of DTV implementation on low power services,

²⁵⁷ Acadiana comments, pp. 2 and 6; Busse comments, p. 6.

²⁵⁸ Apogee comments, p. 3.

²⁵⁹ CBA comments, p. 17.

²⁶⁰ See Second Report/Further Notice, at paras. 39-45; and Second Further Notice, at para. 41.

²⁶¹ See "Interim Report: Estimate of the Availability of Spectrum for Advanced Television (ATV) in the Existing Broadcast Television Bands," OET Technical Memorandum, FCC/OET TM88-1, August 1988 and, "Interim Report: Further Studies on the Availability of Spectrum for Advanced Television," OET Technical Memorandum, FCC/OET TM89-1, December 1989; and, "Preliminary Analysis of VHF and UHF Planning Subcommittee Working Party 3, Doc. 0174 (June 1991).

²⁶² Joint Broadcasters comments, p. 33.

especially the impact with regard to LPTV stations, and believe it is desirable to take certain steps to minimize the impact on those stations. As discussed below at paragraphs 144 to 147, we are adopting a number of changes to our rules, including many of the changes to the technical rules requested by the low power TV and TV translator industries, that will provide additional flexibility to accommodate low power operations during and after the transition to DTV, and thereby substantially mitigate the impact of DTV implementation on this segment of the television industry. We believe that these changes will provide significantly more relief for LPTV than the reservation of channels, as suggested by some commenters. We further believe that these technical relaxations are consistent with the technical changes suggested in the Senate letter on low power. We also note that as secondary operations, LPTV and TV translator stations will be able to continue to operate until a displacing DTV station or a new primary service provider is operational and would receive interference from the low power TV or TV translator station. In this regard, we will continue to allow low power operations on all existing TV channels, including channels 60-69, provided that such operations do not cause harmful interference to any primary operations. We will also permit displaced LPTV or TV translator stations to request operation on these channels on a non-interfering basis.

143. In summary, we believe that the rule changes we are adopting below will preserve many existing low power operations and will open many new channels for those low power operations that might be displaced by DTV. We estimate these changes will permit hundreds of LPTV and TV translators to continue providing service to their viewers. With regard to compensation, as indicated above, we will address this issue in our forthcoming Notice of Proposed Rule Making on reallocation of channels 60-69. Finally, we recognize that most low power stations can continue to operate throughout the DTV transition. We intend to consider in a future rule making whether to create a new class of low power television broadcast stations that would modify the secondary status of these stations and provide them some level of interference protection.

144. *Channel Displacement Relief.* We are adopting our proposal to allow low power stations that are displaced by new DTV stations to apply for a suitable replacement channel in the same area without being subject to competing applications.²⁶³ As suggested by CBA, we are also amending our rules to indicate that such applications will be considered on a first-come, first-served basis without waiting for the Commission to issue a low power application window. Under this approach, the LPTV licensee requesting such a channel or related facilities change would submit an application for the requested channel change. If no other prior requests for that channel had been made within the same area and the application is

²⁶³ This streamlined low power licensing procedure, described herein, will also apply to a request for any channel change from a low power station that is displaced by a DTV station. To provide LPTV operators with as much flexibility as possible in finding a replacement channel, the channel change request can include a replacement channel for NTSC operation or a channel change to be used for DTV operations, on a case-by-case basis. We will also permit displaced stations to request an increase in power or other facility modifications necessary to avoid interference or permit it to continue serving its current coverage area.

acceptable for filing, the Commission would propose to grant the application. Assuming no negative comments or petitions to deny, the request would be granted at the end of the 30 day period. We believe that this approach will minimize the administrative burden and uncertainty in finding replacement channels for displaced LPTV operations.

145. *Technical Rule Changes.* We find that the current interference rules for low power operations are overly restrictive and are adopting a number of rule changes that will provide additional operating flexibility for low power stations, as follows:²⁶⁴

a) *Low Power-to-Low Power Considerations.* As suggested by CBA and Island, we are deleting the current taboo restrictions on use of a channel either 7 channels below or 14 channels above the channel of another station in the low power TV service. We will also allow LPTV and TV translator stations to make use of terrain shielding, Longley-Rice terrain dependent propagation prediction methods and appropriate interference abatement techniques to show that the station will not cause interference to other low power operations. As suggested by Island, we will also allow low power TV and TV translator station operators and applicants to agree to accept interference from other low power TV and TV translator stations.

b) *Low Power-to-NTSC Considerations.* We are eliminating the requirement that low power stations consider the existing full service UHF taboo restrictions on channels +/- 2, 3, 4, or 5 removed from an existing NTSC station, except for stations operating at higher power levels as specified below. These taboos are no longer needed based on measurements conducted by the ATTC.²⁶⁵ We will also allow LPTV and TV translator stations to make use of terrain shielding, Longley-Rice terrain dependent propagation prediction methods, and appropriate interference abatement techniques to show that the low power station will not cause interference to NTSC stations. As suggested by CBA and Island, we will permit low power operations on a channel 7 channels below a full service NTSC operation if it can be shown that the low power station's coverage area is not within an area where the affected NTSC station is regularly viewed over-the-air.

c) *Low Power-to-DTV Considerations.* We are establishing clear D/U signal ratios for interference between low power and DTV operations based on the performance of the ATSC system. We are limiting considerations between low power and DTV operations to co-channel and first adjacent channel interference factors only. In addition, we are specifying that a low power operation need protect only actual DTV operating facilities. In this regard, applications for low power stations will be accepted provided they specify a site outside of

²⁶⁴ For example, the current UHF taboo channel restrictions are based on the interference potential of full service stations operating on these channels. Low power stations are subject to some of the same UHF taboo restrictions even though they operate at much less power and therefore have much less potential for causing interference.

²⁶⁵ See for example, "Record of Test Results Channel Compatible DigiCipher HDTV," Taboo Interference into NTSC, Table 19-9A, page I-19-35, Advanced Television Test Center, January 1993.

the noise-limited service areas, based on actual facilities, of co-channel or adjacent channel DTV stations.²⁶⁶ For co-channel operations, applications for low power stations will be accepted if the low power station's field strength at the edge of the noise-limited service area of the DTV station would be more than 21 dB below the field strength of the DTV station.²⁶⁷ For adjacent channel operations, applications for low power stations will be accepted if the proposed low power station's field strength at the edge of the DTV station's noise-limited service area is less than +48 dB above the field strength of the DTV station.²⁶⁸ Alternatively, applications for low power stations proposing to locate at a site within an adjacent channel DTV station's noise-limited service area will be accepted if the applicant demonstrates that the ratio of the proposed low power station's field strength to that of the DTV station is less than +48 dB at all points within the noise-limited service area of the DTV station. We agree with CBA that low power stations should be permitted to use up-to-date, sophisticated methods of predicting signal coverage, to enable the most efficient use of the spectrum.²⁶⁹ We will allow low power TV and TV translator applicants to make use of terrain shielding and the Longley-Rice terrain dependent propagation methods and other established engineering techniques, such as receiving antenna modelling, to show that interference will not be caused to DTV stations. We will also consider amending our rules in a future proceeding to change our application acceptance criteria to reflect this approach after we have gained practical experience with these techniques and have upgraded our application processing software accordingly.

146. We will entertain requests to waive the LPTV protection standards where it can be demonstrated that proposed LPTV or TV translator stations would not cause any new interference to the reception of TV broadcast analog stations; that is, an LPTV or TV translator station would not be predicted to interfere at locations where there is not already predicted interference from other NTSC TV broadcast stations. We agree with the CBA, Island and other commenters that co-locating with adjacent channel NTSC and TV facilities may prove a vital means of the survival for some LPTV stations. CBA comments that

²⁶⁶ For the purposes of this analysis, the noise-limited service or coverage area of a DTV station is defined as the geographic area where the station's field strength exceeds the values for noise-limited service, as specified in § 73.622(e) in Appendix E herein and in the Fifth Report and Order, less any geographic area where interference may occur from other DTV or NTSC operations.

²⁶⁷ The Advisory Committee's test results indicate that 21 dB is the minimum acceptable D/U ratio between a DTV signal and an undesired NTSC signal in areas at the edge of a DTV station's service contour, where interference from low power service can be expected to occur. See "Record of Test Results of the Grand Alliance System," Advanced Television Test Center, October 1995, Section I-12-2.

²⁶⁸ +48 dB is the maximum allowable (U/D) ratio between an undesired NTSC signal and a desired DTV signal and is based on the performance characteristics of the ATSC DTV System. This value is shown as a D/U ratio in Appendix A.

²⁶⁹ CBA comments, p. 14.

operational experience and measurements show that LPTV and NTSC stations can operate at the same or nearby locations on adjacent channels and on channels separated by fourteen channels.²⁷⁰ Accordingly, we will entertain waiver requests for low power and TV translator applications proposing co-located or nearly co-located facilities to those of TV broadcast analog stations operating on the first adjacent channel above or below, or the fourteenth adjacent channel below. These applications will be accepted if the applicant demonstrates that the predicted signal strength of the proposed station does not exceed by more than 15 dB the signal strength of a first adjacent station, or by more than 23 dB the signal strength of a fourteenth adjacent channel station, at locations within the station's protected contour where the station is regularly viewed. A waiver based on "near" co-location could enable an LPTV station to operate on a channel adjacent to that of a full power station located on a different tower in the same antenna farm. Until we gain some experience with near co-located operations, as described above, we are favorably inclined to limit consideration of such waivers to applications for "displacement relief" filed by LPTV and TV translator permittees and licensees in jeopardy of losing their channels. Finally, we will consider waiving the LPTV interference protection standards when the applicant obtains the written consent of the potentially affected NTSC or TV licensee or permittee to the grant of the waiver. This policy, which has worked well for terrain shielding waivers, permits a full service licensee or permittee to concur that interference is unlikely, but without absolving the LPTV or TV translator applicant of the responsibility to eliminate interference caused to the regularly viewed signal of the station.

147. Currently, stations in the low power TV service are limited to total power output (TPO) of 1000 watts for UHF channels and 10 watts for VHF channels. We agree with Island, VenTech and others that the actual ERP of the station is a more appropriate factor for determining coverage and interference and that the existing TPO limit may be unnecessarily restrictive. We are, therefore, amending our low power rules to replace the existing TPO limits with limits for effective radiated power (ERP), as follows:

Frequency Band	NTSC Power	DTV Power
VHF	3 kW	300 W
UHF	150 kW	15 kW

However, applications for low power NTSC stations on UHF channels proposing an ERP exceeding 50 kW will continue to be subject to the current taboo restrictions for the +/- second through fourth adjacent channels, although we will consider waivers of these restrictions based on showings of noninterference. We believe that the impact on the fifth

²⁷⁰ CBA comments, Technical Exhibit, p.5

adjacent channel is sufficiently minimal to permit us to generally eliminate this restriction as a processing standard in the LPTV service. Although we are providing maximum values of digital ERP for the low power television service, we will defer to a future proceeding matters relating to the general authorization of digital television by low power and TV translator stations.

D. Use of TV Channels 3, 4 and 6

148. In the Sixth Further Notice, we proposed not to allot both Channels 3 and 4 within the same community wherever possible to avoid potential interference to cable terminal devices (set-top boxes) and videocassette recorders (VCRs). These devices typically use either channel 3 or 4 for their output signal and could be vulnerable to interference if there were an off-the-air signal present on the same channel as their output signal. In order to avoid possible interference either to or from FM radio service, we also proposed to make DTV allotments to TV channel 6 only where there is no other readily available allotment opportunity that would provide for adequate replication of an existing station's service area. For cases where it might be necessary to use channel 6, we proposed to apply an appropriate standard similar to that currently specified in the rules to protect against interference between NTSC Channel 6 and FM radio.²⁷¹

149. Comments. The Joint Broadcasters and the EIA support our proposal to avoid use of channels 3 and 4 in the same market to avoid problems in using cable terminal devices and videocassette recorders.²⁷² They agree that cable systems, broadcasters, equipment manufacturers and the public should not be burdened with the interference problems that would ensue if neither channel 3 nor 4 is available for VCR and cable set-top box use. The EIA states that consumers will obviously benefit enormously if there is no increase in the potential for interference to VCRs and set-top boxes.

150. The Santa Monica Community College District (SMCCD), the licensee of an FM radio station in Santa Monica, CA supports our proposal not to use channel 6 for provision of DTV service. It is concerned that the quality of its FM radio service would be degraded if we were to allot channel 6 for DTV operation in Los Angeles. On the other hand, the Joint Broadcasters submit that, with proper engineering design and safeguards, channel 6 can be used for DTV during the transition. They indicate that the lower power of DTV transmitters, the improved performance of DTV transmitters with regard to out-of-band emissions, and improved performance capabilities of DTV receivers will reduce the potential for interference

²⁷¹ The rules regulating TV channel 6 and FM radio interference are set forth in 47 CFR 73.207(c), 73.525 and 73.610(f). TV channel 6 is restricted with respect to the IF separation to FM channel 253 (Section 73.610(f) of the rules). Commercial FM stations on channel 253 and noncommercial educational FM stations on FM channels 201-220 must protect TV channel 6. There are no restrictions on new TV channel 6 stations or changes with respect to FM channels 201-220.

²⁷² Joint Broadcasters comments, p. 18; EIA comments, p. 5.

between DTV channel 6 and FM radio service.²⁷³

151. Decision. We continue to believe it is important to avoid the allotment of both channels 3 and 4 in the same market and to avoid the use of channel 6 in developing DTV allotments. As we observed in the Sixth Further Notice, broadcast operation on both channels 3 and 4 in the same market would result in conflict with cable terminal devices, VCRs and other TV interface devices that provide output signals selectably on either channel 3 or 4. Also, DTV operation on channel 6 could pose potential conflicts with FM radio service on adjacent frequencies. Accordingly, we have developed the DTV Table to avoid any instances where channels 3 and 4 would both be used in the same area and have minimized the use of channel 6, so that the new DTV Table contains only two allotments on channel 6.

E. Land Mobile Sharing

152. In the Sixth Further Notice, we set forth proposals for protecting against possible interference between DTV stations and land mobile operations. The rules currently authorize sharing between land mobile and TV operations on frequencies in the range of UHF channels 14-20, which occupy the 470-512 MHz band, in 13 urbanized areas, the Gulf of Mexico offshore region and Hawaii.²⁷⁴ Based on the performance characteristics of the ATSC DTV system, we proposed to allow DTV stations to operate at co-channel and adjacent channel spacings to the city-center of land mobile operations as close as 250 km (155 miles) and 176 km (110 miles), respectively.²⁷⁵ We also noted that some additional conditions may be

²⁷³ Joint Broadcasters comments, p. 48.

²⁷⁴ See 47 CFR §2.106, Notes NG66, NG114 and NG127. The 13 urbanized areas where UHF channels may be used for land mobile operations and the channels set aside for such operations in those areas are:

	TV Channel
New York-Northeastern New Jersey	14, 15
Los Angeles	14, 16, 20
Chicago-Northwestern Indiana	14, 15
Philadelphia, PA-New Jersey	19, 20
Detroit, MI	15, 16
San Francisco-Oakland, CA	16, 17
Boston, MA	14, 16
Washington, DC-Maryland-Virginia	17, 18
Pittsburgh, PA	14, 18
Cleveland, OH	14, 15
Miami, FL	14
Houston, TX	17
Dallas, TX	16

²⁷⁵ Currently, our practice is to evaluate petitions for rule making requesting new television allotments on the same channel as, or first adjacent channel to, a channel used in a nearby area for land mobile service on a case-by-case basis. In these case-by-case evaluations, spacing standards derived from policy statements in Docket No. 18261 are used. Under these standards, the transmitter site of a new NTSC TV station must be at

necessary in those few instances where these spacing distances cannot be met.

153. The draft DTV Table included with the Sixth Further Notice assumed that channel 20 would remain available for land mobile operations in Philadelphia. However, the broadcast industry, in developing sample DTV plans, assumed that the land mobile use of channel 20 in Philadelphia would be eliminated and that this frequency would be available for DTV purposes. We recognized, as argued by broadcasters, that the elimination of channel 20 for land mobile operations in Philadelphia could significantly reduce the interference among TV stations in the congested northeast corridor. We also recognized that there are a substantial number of land mobile operations licensed in the Philadelphia area.²⁷⁶ We therefore requested comment on the impact of eliminating channel 20 use for land mobile service in Philadelphia and on whether the reduction in interference to broadcast service would outweigh the benefits of maintaining channel 20 for land mobile use in Philadelphia. We also noted that our existing border agreements with Canada preclude activation of land mobile stations on channels 15 and 16 in Detroit and channels 14 and 15 in Cleveland, and proposed to make these channels available for DTV allotment purposes in those markets.

154. Comments. The Joint Broadcasters submit that we should allow a minimum co-channel spacing of 240 km (146 miles) between DTV allotments and the city center of land mobile channels that occupy channels in the range 14-20.²⁷⁷ They state that these spacings are necessary to avoid interference to NTSC and DTV service. UTC submits that we need to ensure that the proposed separation distances will adequately protect land mobile operations operating pursuant to the new private land mobile refarming rules that were adopted in PR Docket No. 92-235.²⁷⁸ It asks that we review our proposed co-channel and adjacent channel spacing criteria for DTV and land mobile operations in light of the power, antenna height and channel spacing requirements applicable to land mobile operations pursuant to the new refarming rules.

155. Land mobile users and parties representing their interests also express concern that interference will occur where DTV allotments are short-spaced to land mobile operations.

least 345 km (212 miles) from the city-center of a co-channel land mobile operation and at least 230 km (140 miles) from the city-center of an adjacent channel land mobile operation. In the Second Further Notice, we stated that because DTV stations are expected to operate with 10 dB less power than NTSC stations, we believe it is acceptable to allow DTV stations to operate closer to land mobile operations than is permitted under our current TV station/land mobile spacing policy. We stated that we generally believe that it would be possible to allow DTV stations to operate at co-channel and adjacent channel spacings to the city-center of land mobile operations as close as 250 km (155 miles) and 176 miles (110 miles), respectively. Second Further Notice, at para. 46. We maintained this proposal in the Sixth Further Notice. Sixth Further Notice, at para 76.

²⁷⁶ Over 600 licenses have been granted for land mobile use of channel 20 in the Philadelphia area.

²⁷⁷ Joint Broadcasters comments, p. 45.

²⁷⁸ UTC comments, p. 10.

APCO, the LMCC, Motorola and UTC submit that adjustments to the draft DTV Table are necessary to protect existing public safety and land mobile operations.²⁷⁹ These parties are particularly concerned that short-spaced DTV allotments in the New York, San Francisco, and Los Angeles areas would disrupt land mobile service in those areas. APCO notes that land mobile transmitters are allowed to operate anywhere within a 50-mile radius of the geographic center of the relevant city. It states that in several instances adjacent channel DTV operations in the draft Table would be virtually co-located with existing land mobile facilities. Motorola similarly notes that in some cases allotments in our draft Table would be as close as two miles to the reference coordinates of adjacent channel land mobile cities. The LMCC argues that without modification, our draft DTV allotment plan would result in interference to land mobile operations.²⁸⁰ UTC states that the broadcast community and the Commission should offer technical solutions to protect these important land mobile operations.²⁸¹ Motorola states that without significant reductions in DTV out-of-band emissions (at least 30 dB), land mobile use of its allocated spectrum will be impossible. Motorola also provides specific recommendations for alternative allotments to minimize this inter-service problem.

156. AC Transit is concerned that our proposals to allot channels 15 and 18 for DTV use in the San Francisco area could conflict with its operations on channels 16 and 17.²⁸² The CDGS states that these DTV allotments would adversely affect the current land mobile operations permitted on channels 14-20 in California, including vital public safety operations on those channels.²⁸³ It notes that the draft Table provides no separation between proposed DTV allotments on channels 15 and 18 and land mobile channels 16 and 17 in the San Francisco/Oakland metropolitan area. It also notes that the draft Table provides no separation between the proposed DTV allotment on channel 21 in Los Angeles and land mobile channel 20. It further states that the proposed DTV allotments on channel 15 in Corona (66 km separation) and channel 19 in San Bernardino (88 km separation) provide significantly less than the proposed 176 km minimum separation distance. The CSAA is concerned that interference could occur to its land mobile operations on channel 17 frequencies if we allot channels 18 and 19 for DTV service in the San Francisco area, as proposed on the draft Table.²⁸⁴ LA County is particularly concerned with regard to the proposed allotment of

²⁷⁹ APCO comments, p. 4; LMCC comments, pp. 2, and 12-16; Motorola comments, p. 2; and UTC comments, p. 11.

²⁸⁰ The LMCC notes that our recently released Inventory of Spectrum Usage shows 41,705 land mobile base and fixed stations operating within these channels. The LMCC also notes that private radio statistics from our 1994 annual report show over 400,000 transmitters authorized for that band at that time.

²⁸¹ UTC comments, p. 11.

²⁸² AC Transit comments, pp. 2-3.

²⁸³ CDGS comments, p. 2.

²⁸⁴ CSAA comments, p. 1-3.

channel 15 for DTV use in Corona, CA.²⁸⁵ It states that the transmitter site for this station would be on Mt. Wilson, just 2.2 miles from a current channel 16 land mobile radio base station used by the Sheriff's Department. It states that this allotment would pose a significant danger of harmful interference both to vital safety communications and to the television service to be broadcast on that channel. It also submits that other fixed and mobile transmitter sites that operate on channel 15 are also in the "line of sight" of Mt. Wilson and could be affected by interference.

157. A number of local government administrations and public safety users submit that our draft Table allotment of channels 18 and 21 for DTV use by TV channel 65 in Vineland, NJ and TV channel 9 in Secaucus, NJ, respectively, would harm public safety communications in the Pennsylvania/New Jersey area.²⁸⁶ For example, the MVFC states that the Gloucester County Communications Center and the local emergency response units have recently converted to the 500 MHz band at a cost of millions of dollars to taxpayers. It submits that the taxpayers of Gloucester should not have to pay the cost in loss of lives, property and tax dollars that will occur if TV station operate on these frequencies. It estimates that the costs to again replace the local radio and paging system would be in excess of \$100,000. In addition, Congressman Rob Andrews and Congressman Curt Weldon submitted joint comments stating that while they support our effort to expand use of the spectrum to allow DTV service, they are concerned that the operation of existing public safety communications systems could be impeded in Pennsylvania and New Jersey.²⁸⁷ They submit that any allotment of DTV channels that would hinder the effectiveness of these networks is not in the public interest and urge that we adopt a different approach. In addition, Chris-Craft/United Group (Chris-Craft) is also concerned that the allotment of channel 18 in the draft Table for its WWOR-TV, Secaucus, NJ would cause unacceptable interference to land mobile operations in Philadelphia on adjacent channel 19 and asks that we change this allotment.²⁸⁸ It notes that the distance between the tower site for the Secaucus station on the World Trade Center and center-city reference location for Philadelphia is only 80 miles, which is 60 miles short of the proposed 140 miles adjacent channel spacing to land mobile systems.

158. The LMCC and Motorola provide suggestions for engineering solutions to prevent interference to the land mobile operations in short-spaced situations.²⁸⁹ They first

²⁸⁵ LA County comments, p. 9-10.

²⁸⁶ These parties include the Barnsboro Fire Co. No. 1 (BFC), the Glassboro Emergency Medical Services (GEMS), the Mantua Volunteer Fire Company (MVFC), and many others.

²⁸⁷ Congressmen Andrews and Weldon are Co-chairmen of the Congressional Fire Services Caucus.

²⁸⁸ Chris-Craft comments, p. 3.

²⁸⁹ LMCC comments, pp. 13-16; Motorola comments, p. 15.

submit that a significant tightening of the DTV emissions mask may partially reduce the level of interference for some of the adjacent channel situations. The LMCC states that in practice many NTSC transmitters currently provide approximately 60 dB of protection at the band edge. It also submits that some channel 14 and channel 69 stations already operate at reduced power and/or have installed additional filtering to the visual carrier in order to help reduce interference to adjacent channel land mobile users. In an appendix to its comments, Motorola provides a technical discussion indicating that a minimum 30 dB of additional attenuation in the DTV emissions mask is needed to minimize the potential for adjacent channel interference to land mobile services from short-spaced DTV allotments. Motorola also suggests that we modify the DTV allotment plan to allow short-spacings on an *ad hoc* basis. It states that in some cases, even more attenuation will be needed to avoid the loss of useable mobile spectrum. Both the LMCC and Motorola state, however, that given the extreme short-spacings involved in some of the draft DTV allotments, and the relative powers of television and land mobile operations, it is unlikely that additional filtering of the DTV output will be the total solution for avoiding harmful interference. Motorola notes that the draft Table included 13 cases where the adjacent channel is less than 10 miles from land mobile operations. It indicates that even greatly reduced DTV emissions will not eliminate adjacent channel interference problems close to (i.e., within 10 miles) a DTV transmitter nor would it address the potential for land mobile interference to DTV receivers. It states that this is an issue where continued analysis is needed by all parties concerned. Motorola urges that we indicate on any short-spaced DTV license that it remains the obligation of the DTV licensee to correct any interference without cost to the land mobile licensee. It notes this approach is consistent with our "last in fixes the interference problem" policy we have already adopted for TV licensees operating on channels 14-20 that are adjacent to land mobile operations.

159. Land mobile interests argue that we should maintain and protect the current allocation of channel 20 for land mobile use in Philadelphia. APCO notes that there are an estimated 9,600 units licensed to public safety agencies now operating on channel 20 in Philadelphia and argues that these are vital operations that must not be disrupted.²⁹⁰ The Department of Communications, County of Bucks, PA (Bucks County) similarly states that it operates a twenty frequency pair police radio system on channel 19 (500-506 MHz) and has been looking for frequencies in channel 20 (506-512 MHz) that might help to alleviate its current crowding.²⁹¹ UTC states that a number of its members operate systems on channel 20 in Philadelphia and that, given the extreme congestion in the land mobile frequencies in the northeast corridor, alternative spectrum may be difficult, if not impossible, to locate. It submits that we should not force these licensees to relocate without identifying adequate replacement spectrum and that we should impose an obligation on the DTV licensees that will

²⁹⁰ APCO comments, p. 18.

²⁹¹ UTC comments, p. 2.

operate in this band to pay to relocate the land mobile users to comparable facilities.²⁹²

160. The Joint Broadcasters indicate that, as we observed in the Sixth Further Notice, making channel 20 available for DTV significantly reduces interference in the congested northeast region. In taking this position, Joint Broadcasters state that they support reallocation of land mobile channels in all markets, not just the Philadelphia area, for the transition to DTV. They submit that using for DTV at least one of the channels now allocated for land mobile use, particularly those that are lightly used, would improve interference during the transition period and simplify the DTV allotment/assignment process. The Joint Broadcasters submit that such reallocation would not impair land mobile operations. They suggest that a more efficient use of the spectrum would be to make one of the land mobile channels in each market available solely to public safety services. Under this plan, non-safety related services would make use of frequencies in the 800 MHz, 900 MHz and 2 GHz PCS spectrum.

161. In its reply comments, the Broadcasters Caucus state that the unavoidable reality of the land mobile television sharing issue is that it is necessary to use channels 14-20 in certain areas in order to accommodate all eligible broadcasters and that it is in the very regions where interservice sharing occurs that broadcast channels are most scarce.²⁹³ The Caucus submits that the proposed spacing requirements are based on test data from the Advisory Committee and should provide sufficient protection for both television stations and land mobile operations on channels 14-20. It further states that, as with other aspects of the DTV Table, market-by-market adjustments can be made throughout the transition should real-world data show the need for fine-tuning.

162. UTC states that in order to protect land mobile operations, we should reconsider our proposals to make channels 15 and 16 in Detroit and channels 14 and 15 in Cleveland available for DTV operations.²⁹⁴ It argues that although these channels are currently precluded from land mobile use due to existing border agreements with Canada, there is an existing need for spectrum in the Cleveland and Detroit areas for land mobile operations and this need is expected to increase in the near future. It therefore urges that we redouble our efforts to secure a satisfactory sharing agreement with Canada to allow use of these channels for land mobile operations. Gateway Communications Inc. (Gateway) notes that Offshore Radio Communications Services (ORTS) are permitted within specified areas within the Gulf Of Mexico and adjoining U.S. land areas on TV channels 15, 16, and 17. It submits that several allotments in the draft Table would conflict with ORTS operations and asks that we

²⁹² UTC comments, pp. 10-11.

²⁹³ Broadcasters caucus comments, pp. 29-30.

²⁹⁴ UTC comments, p. 10.

clarify and resolve this issue.²⁹⁵

163. Decision. In both the Second Further Notice and the Sixth Further Notice, we proposed minimum separation distances between DTV and existing land mobile operations on channels 14 to 20. We find that our proposed minimum spacing distances between co-channel and adjacent channel DTV and land mobile operations are appropriate for avoiding interference and ensuring the operation of both DTV and land mobile services. We also find that these separations are appropriate given our recent changes for "refarming" in the land mobile services, as noted by UTC. Accordingly, we generally have attempted to provide allotments for DTV stations at co-channel and adjacent channel spacings to the city-center of land mobile operations of at least 250 km (155 miles) and 176 km (110 miles), respectively. We will also use these separation distances as the land mobile-to-DTV spacing standards for any future DTV allotments.

164. We recognized, however, that in developing the initial DTV Table there would be some instances in which these separation distances could not be met and that additional conditions would be necessary to avoid interference. As noted by the commenting parties, the draft Table included several instances where DTV allotments used channels adjacent to existing land mobile operations in the same area. In particular, the situations of most concern occurred in the Los Angeles, San Francisco, and New Jersey areas. In preparing the final Table, we have resolved or substantially reduced these land mobile/DTV sharing problems. In the San Francisco area, we have worked with local public safety representatives to take terrain shielding into account and thereby develop alternative allotments that will avoid interference to land mobile operations. In addition, as a result of our negotiations with the Mexican government, we have been able to provide alternative channels for the proposed DTV allotments that posed conflicts with land mobile operations in the Los Angeles area. The DTV Table of Allotments includes only one instance where our co-channel separation distance could not be met and only nine instances where our adjacent channel separation is not met. Unlike the draft Table, there are no instances of close spacings between DTV and land mobile on adjacent channels, *i.e.*, less 10 miles, that were of concern to Motorola and other land mobile parties. Given that our spacing requirements were chosen to be very conservative in protecting both DTV and land mobile operations, we believe that these ten situations should not present a significant problem for either land mobile or DTV licensees.²⁹⁶

²⁹⁵ Gateway comments, p. 8.

²⁹⁶ We recognize the comments with regard to use of channel 18 for DTV service in the New Jersey. As suggested in the Broadcasters' Modified Table, the Table of Allotments included herein pairs this channel with a noncommercial station in New Brunswick, New Jersey. In providing this allotment, we recognize that the majority of the New Brunswick area is also served by the three other stations in the New Jersey public broadcast network. Thus, if some restrictions on the use of channel 18 are necessary to protect existing land mobile operations, viewers in the New Brunswick area should still be able to receive noncommercial DTV service. We will work with the New Jersey public broadcasting authorities to design a plan that will minimize any impact this allotment has on its network and services.

However, if such problems occur, it will be the initial responsibility of the DTV licensee to protect against or eliminate harmful interference to land mobile services that have commenced operations and that are operating in accordance with our rules at the time the DTV licensee goes on the air.

165. With regard to use of channel 20 for DTV purposes in the Philadelphia area, we agree with the land mobile interests that this channel should remain for land mobile use. As APCO notes, there are over 9,000 licensed public safety operations that are now providing vital services on channel 20 frequencies. Concerning UTC's request to make additional land mobile use of channels 14-16 in Cleveland and Detroit, we find that these channels are needed for DTV service, especially to allow us flexibility in completing a DTV channel arrangement with Canada. We also note that our spectrum recovery plan may provide relief for any additional land mobile spectrum needs in these markets. Finally, with regard to Gateway's concern about the impact of DTV operations on ORTS, we note that the offshore telephone service must protect TV operations on channels 15, 16, and 17.²⁹⁷ We clarify that this will include new DTV operations on these channels. We will, however, allow ORTS operators to work out arrangements with broadcasters to protect such DTV operations and maintain ORTS services by methods other than the spacing requirements contained in the rules.

F. DTV Frequency Labeling Plan

166. Under our proposed DTV core spectrum plan, DTV service was to occupy the frequencies now used by NTSC channels 7-51. In the Sixth Further Notice, we stated the it would seem appropriate to establish a new labeling scheme for the DTV frequencies, so that TV frequencies in the future would not begin with "Channel 7." We requested proposals and comments relating to an appropriate frequency labeling scheme for DTV service.

167. Comments. The Joint Broadcasters believe that the most important aspect of any channel labeling scheme should be maintaining channel identity, so that viewers can readily identify the corresponding DTV channels and NTSC stations both during and after the transition.²⁹⁸ They also state that DTV channel labels should be as brief and simple as possible. They submit that a labeling scheme that is easy to follow and that preserves identity over time and across carriers may alleviate station anxieties about losing viewers due to DTV assignments. The Joint Broadcasters believe this could reduce requests for channel changes and encourage stations to build DTV facilities sooner, rather than later. The Joint Broadcasters do not comment on specific suggestions for labeling DTV channels. Rather, they recommend that we allow this matter be explored by an inter-industry committee that would prepare a recommendation for the Commission. Members of this committee would

²⁹⁷ See, for example, 47 CFR §22.1013(c).

²⁹⁸ Joint Broadcasters comments, p. 63.

include representatives of the broadcasting industry, equipment manufacturers, and cable industry. AAPTS supports the Joint Broadcasters' call for an industry committee to recommend a DTV frequency labeling plan.²⁹⁹ It states that this issue deserves careful analysis and input by all affected industries.

168. The EIA believes that we should await a recommendation from the ATSC before addressing DTV channel labeling issues.³⁰⁰ It states that in promoting the transition to DTV we should take care to minimize disruption of the existing labelling scheme, and seek to ensure consistency across various transmission media. The EIA states, for example, that if the DTV labelling plan is not coordinated between broadcasters and cable operators, consumers will surely have a harder time acclimating to the DTV environment. It states that to head-off consumer frustration and speed the transition, any new scheme should be easy to assimilate and use. Mr. Smith submits that DTV channels should be labeled in such a way that they are seamless when a viewer switches between NTSC and DTV stations. He states that any labeling system that is overly complex will alienate viewers.³⁰¹

169. A number of parties offer specific suggestions for labeling DTV channels. Blade, Mr. Ronald J. Brey, Gateway, Kentuckiana, and KUPN-TV recommend that DTV channels be prefixed with a "D."³⁰² KUPN-TV also states that the primary concern should be retention of call letters to maintain station identity.³⁰³ LeSEA suggests a plan for labeling DTV channels with the prefixes "Q," "X," "Y," and "Z" and the numerical designations 2-13.³⁰⁴ Cannell states that we should number the DTV channels sequentially, beginning with "1."³⁰⁵ Mr. Brey also proposes that we specify DTV channel designations as double digits beginning with "D11." He submits that any subchannels could be designated by an alphabetical letter beginning with "A," and that we could drop the "D" prefix after the transition is complete.

170. Decision. We do not believe that it is necessary to prescribe a special DTV channel designation scheme at this time. Accordingly, we will allow this matter be explored by an inter-industry committee that would prepare a recommendation for the Commission.

²⁹⁹ AAPTS comments, p. 42.

³⁰⁰ EIA comments, pp. 5-6.

³⁰¹ Mr. Smith comments, p. 11.

³⁰² Blade comments, p. 2; Brey comments, p. 11; Gateway comments, p. 9; Kentuckiana comments, p. 8; and KUPN-TV comments, p. 2.

³⁰³ KUPN-TV comments, p. 2.

³⁰⁴ LeSEA comments, p. 6.

³⁰⁵ Cannell comments, p. 5.

We encourage those organizing this committee to include membership from all interested parties, including broadcasters, equipment manufacturers, cable operators, and the public.

G. International Coordination.

171. As indicated in the Second Further Notice, we have been coordinating for some time now with Canada and Mexico on the allotment of DTV channels in the border areas.³⁰⁶ We are working to complete interim agreements on DTV with both of these countries. We have also coordinated the DTV Table with the Canadian and Mexican administrations and believe that it will be generally acceptable to them. We therefore expect that only minor adjustments will be necessary to conform the Table to these agreements.

H. Negotiations and Frequency Coordinators

172. In the Sixth Further Notice, we stated that mechanisms are needed to consider changes to the Table of Allotments. In this regard, we stated that we intend to provide broadcasters with the flexibility to develop alternative allotment approaches and plans both before and after our adoption of a final Table of Allotments. Consistent with this view, we stated that voluntary negotiations among broadcasters should be permitted as part of the DTV allotment/assignment process. We therefore proposed to permit broadcasters within a community to negotiate among themselves their designated allotments and to develop an alternative allotment/assignment plan for their local area. We indicated, however, that all affected broadcasters, including those in neighboring geographic areas, must agree to the revised plan and the change must not result in additional interference to other stations or allotments.³⁰⁷ We also proposed not to accept negotiated changes that would adversely limit our ability to gain the full benefits of spectrum reclamation if that approach were adopted. In addition, any changes would be subject to international coordination, as appropriate. We proposed to require that all requests for DTV channel changes among stations be signed by the licensees of all of the stations involved in the exchange. We also proposed to allow such

³⁰⁶ See Second Further Notice, at para. 49. Use of television frequencies in the Canadian and Mexican border areas currently are governed by international agreements. Use of these frequencies in the Canadian border area are governed under the "Agreement Relating to the Allocation of Television Channels," exchange of notes at Ottawa April 23, and June 23, 1952, entered into force June 23, 1952, 3 UST 4443, TIAS 2594, 207 UNTS 25, Amendment: February 26 and April 7, 1982 (TIAS 10645). Use of these frequencies in the Mexican border areas are governed under two agreements: 1) "Agreement Relating to the Assignment and Use of Television Channels Along the United States-Mexican Border," exchange of notes at Mexico April 18, 1962, 13 UST 997; TIAS 5043; 452 UNTS 3; and 2) "Agreement Relating to Assignment and Usage of Television Broadcasting Channels in the Frequency Range 470-806 MHz (Channels 14-69) Along the United States-Mexico Border," signed at Mexico June 18, 1982, entered into force January 17, 1983, TIAS 10535, Amendments: October 31, 1984 and April 8, 1985, June 22 and October 19, 1988.

³⁰⁷ We proposed that an "affected broadcaster" would be a broadcaster whose allotment within a community would be changed or whose existing NTSC or new DTV service area would be affected technically by a proposed change to the Table.

exchanges to include agreements for compensation. We further observed that in some cases it might be advantageous for broadcasters to co-locate their DTV transmitters at a common site. We therefore requested comment on whether we should provide special incentives to encourage the broadcasters in a market to locate all of their DTV operations at a common transmitter site.

173. In the Sixth Further Notice, we also noted that parties representing broadcasting interests suggested that we establish industry assignment coordinating committees to evaluate proposals for post-assignment changes to the table.³⁰⁸ These parties recommended an approach under which industry coordinating committees would use objective engineering criteria to evaluate proposals for post-assignment changes to the DTV Table. The assignment coordinators would make recommendations to the Commission about how to dispose of allotment/assignment proposals or would provide the Commission with the detailed coverage and interference data necessary to make these decisions. We tentatively agreed that an industry pre-coordination process could promote a smoother and more orderly process for modifying the DTV Table. We therefore invited industry to pursue the establishment of such coordinating committees. We proposed that such committees would evaluate and provide advice to the Commission with regard to coordination of changes in allotments; the creation of new allotments; and, changes in authorized facilities (for both NTSC and DTV stations) that would impact other allotments/assignments.

174. Comments. The Joint Broadcasters submit that, over the course of the transition, a significant number of changes will be needed to any DTV Table that is adopted.³⁰⁹ Pulitzer states that the flexibility for licensees to make changes in their DTV allotments is important in view of uncertainties that remain about the feasibility of specific channels for DTV use; DTV propagation characteristics on VHF versus UHF channels; the feasibility of specific NTSC/DTV channel pairings; DTV receiver characteristics; and the appropriate DTV transmission power to achieve replication.³¹⁰ Grant states that flexibility is needed to ensure fairness and to permit improvements to the Table.³¹¹ Pappas states that flexibility to modify allotments is particularly important to broadcasters that acquired lower-powered stations with the intent of building them into higher-powered facilities.³¹² The Joint Broadcasters and Chris-Craft also submit that our procedures should provide for expedited processing of

³⁰⁸ See for example, MSTV filing in this proceeding submitted, January 13, 1995.

³⁰⁹ Joint Broadcasters comments, p. 48.

³¹⁰ Pulitzer comments, p. 2.

³¹¹ Grant comments, p. 1.

³¹² Pappas comments, p. 23.

requests for modifications of the initial DTV Table.³¹³ The Joint Broadcasters further state that we should adopt any proposed change, whether pre- or post-adoption of a DTV Table that does not cause unacceptable additional interference to assigned NTSC or DTV channels.³¹⁴

175. APTS states that there are numerous variables that may affect the desirability of channels in individual markets, and the affected stations should have the freedom to negotiate changes in their assignments both before and after adoption of the DTV Table.³¹⁵ It submits that some stations may wish to negotiate changes in both their NTSC and DTV channel assignments as part of a negotiated "re-pairing" of channels. ABA and several other submitted negotiated allotments for specific areas. As discussed below, we have considered these plans and, where feasible, included them in the DTV Table of Allotments we are adopting herein.

176. Pulitzer, VCY America and WB also advocate that we allow additional flexibility for stations to specify an alternative set of coordinates for their initial DTV allotment. Pulitzer states that, for post-adoption changes, we should permit stations to specify an alternative set of coordinates within the proposed three-mile radius of their existing transmitter site or any other distance away from the current transmitter site provided that: 1) service from the alternative site meets the requirements for coverage of the community of license; and 2) operation from the alternative site meets the allotment technical criteria to ensure that significant interference to other stations will not occur.³¹⁶ Pulitzer states that this type of flexibility would facilitate agreements between two or more stations in a market to use a common antenna site for their DTV operations. VCY America recommends that we encourage stations to seek co-located sites in order to minimize orientation and adjacent channel technical problems.³¹⁷ WB states that allowing stations to relocate to a common site more than three miles from their designated sites could avoid interference between stations that would otherwise be subject to a UHF taboo constraint.³¹⁸

177. The Joint Broadcasters and others support the use of private frequency

³¹³ Joint Broadcasters comments, p. 55; Chris-Craft comments, p. 7.

³¹⁴ Joint Broadcasters comments, p. 50.

³¹⁵ APTS comments, p. 28.

³¹⁶ Pulitzer comments, p. 6.

³¹⁷ VCY America comments, p. 5.

³¹⁸ WB comments, pp. 11-12.

coordinating committees.³¹⁹ The Joint Broadcasters submit that the use of industry committees will facilitate efficient and fair resolution of proposed modifications to the DTV Table while minimizing the burden on the Commission. They recommend that the coordinating committees be permitted to review all modification requests, including channel change requests, requests for new DTV assignments, requests for transmitter site relocations and other facility changes (for both NTSC and DTV stations), co-location issues, and adjacent channel and land mobile interference concerns.³²⁰ The Joint Broadcasters further state that under their plan, the Commission would retain ultimate control of the process through its ability to monitor the committee's performance and responsiveness through licensee surveys and similar studies.³²¹

178. Other broadcasters, including the LABCTS, Pappas, and VCY America also support the use of an industry coordinating committee process to facilitate changes in DTV channel allotments/assignments. The LABCTS believes that industry coordinating committees can help to address the unique allotment problems of congested areas.³²² It recommends that we assign regional coordination areas centered on major metropolitan areas to regional coordinating committees that would recommend local modifications to the national DTV Table of Allotments. The LABCTS also states that the regional coordinating committees should provide for equal representation from all stations requesting representation in the region. Pappas supports the Joint Broadcasters in calling for consideration of newly-filed and pending applications for construction permits to modify such facilities on a first-come/first-served basis.³²³ Pappas submits that broadcasters such as itself who have had modification applications on file for months prior to the adoption of the Sixth Further Notice and have expended considerable resources in prosecuting those application should be given preference

³¹⁹ Parties specifically supporting the establishment of industry assignment coordinating committees include Harris, the Joint Broadcasters, LABCTS, Meredith, NBC, Pappas, Rural, and VCY America.

³²⁰ Joint Broadcasters comments, p. 56.

³²¹ On January 10, 1997, the Broadcasters Caucus submitted a Petition for Further Rule Making requesting that we establish a DTV coordination process and proposing a plan for the structure, operating rules and composition of industry coordinating committees. The Caucus submits that DTV coordinating committees should function according to the basic principles established in the private land mobile radio service for frequency coordinators. In particular, it proposes that the coordinating committees: 1) be representative of the industry; 2) generally process requests in the order in which they are received; 3) provide all stations that might be affected by a proposed change notice and an opportunity to comment, object, or submit their own proposals that could be precluded by a proposal under consideration; 4) provide coordination services on a nondiscriminatory basis for reasonable fees; 5) serve in a purely advisory role to the Commission; and 6) help resolve licensee disputes. The Caucus also proposes that the committees function on a coordinated fashion nationwide, using an updated data base and the methodology described in the Joint Broadcasters' comments responding to the Sixth Further Notice.

³²² LABCTS comments, p. 4.

³²³ Pappas comments, pp. 2 and 9.

over later-filed applicants.³²⁴

179. BET submits that negotiated agreements regarding DTV allotments/assignments should not be allowed to interfere with the reclamation of NTSC spectrum for new entrants.³²⁵ APCO states that any changes to the DTV Table resulting from private negotiations by television stations should not be permitted to prejudice or limit the amount of spectrum available for reallocation to public safety.³²⁶

180. Apogee, CBA and VenTech argue that full power stations should be required to include LPTV stations in any negotiations relating to allotment changes.³²⁷ In statements representative of the views of these parties, VenTech argues that LPTV stations should be allowed to negotiate interference rights with broadcasters if any negotiations are allowed at all. It states that because LPTV stations compete with full service stations, full service stations will be tempted to seek channels that actually eliminate LPTV stations.³²⁸ VenTech also states that stations negotiating to operate their DTV services from a common site should be allowed to do so only if they also negotiate good faith understandings to avoid interference with LPTV stations in the market.

181. CBA and others argue that private coordinating committees should not be given any authority to make changes unless the committees are required to give notice and to be open to all participants, including LPTV operators.³²⁹ CBA further argues that the private coordinating committees should be directed to establish a priority for preserving LPTV service. Apogee states that the Commission must require full service stations to negotiate with low power stations.³³⁰

182. Decision. Throughout this proceeding, we have recognized that the implementation of DTV will be a dynamic process. We believe that continued industry negotiation and coordination efforts will help to facilitate this process and accommodate the inevitable changes that will occur. Accordingly, we encourage the industry to continue their current voluntary coordination efforts. We believe that an approach similar to that set forth in the Broadcasters Caucus' petition provides an appropriate model for industry coordination of

³²⁴ Id., pp. 23-24.

³²⁵ BET comments, p. 9.

³²⁶ APCO comments, p. 14.

³²⁷ Apogee comments, p. 3; CBA comments, pp. 9-10; VenTech comments, p. .

³²⁸ VenTech comments, pp. 6-7.

³²⁹ CBA comments, pp. 9-10.

³³⁰ Apogee comments, p. 3.

DTV allotment and facility modifications.³³¹ We also believe, however, that it is important that any voluntary negotiation or coordination effort be open to all affected parties, including low power broadcasters and the public, and will require that such negotiations be open to all affected parties. In this regard, we will review all requests for modification of the DTV Table for their impact on low power stations. Industry coordinating committees therefore are strongly advised that they should consider LPTV and TV translator stations in developing proposed modifications to the DTV Table and avoid impact on such stations wherever possible. Parties coordinating proposals for changes to the DTV Table are also advised that we will not consider requests for allotment modifications that would relocate an allotment to a channel in channels 60-69, nor will we consider creating new DTV allotments in this area of the spectrum.

V. ALLOTMENT METHODOLOGY AND APPROACH

183. On December 24, 1996, we issued a Fourth Report and Order in this proceeding in which we adopted a standard for the transmission of digital television.³³² This standard is a modification of the ATSC³³³ DTV Standard and is consistent with a consensus agreement voluntarily developed by a broad cross-section of parties, including the broadcasting, consumer equipment manufacturing and computer industries.³³⁴ The standard we adopted differs from the ATSC DTV Standard in that it does not include the ATSC specifications with respect to scanning formats, aspects ratios, and lines of resolution.

184. In the Sixth Further Notice, we proposed to use the performance characteristics of the ATSC DTV system in developing DTV allotments and used these characteristics in developing the draft DTV Table of Allotments set forth therein.³³⁵ We also proposed to perform the engineering evaluations for determining service coverage area and interference using the terrain dependent Longley-Rice point-to-point propagation model, technical planning

³³¹ See description of Caucus' petition in footnote above.

³³² See Fourth Report and Order, MM Docket No. 87-268, 11 FCC Rcd 17771 (1996).

³³³ "ATSC" is the Advanced Television Systems Committee, an industry organization whose members include television networks, motion picture and television program producers, trade associations, television and other electronic equipment manufacturers and segments of the academic community.

³³⁴ See letter of Broadcasters Caucus, Consumer electronics Manufacturers Association and Computer Industry Coalition on Advanced Television Service, dated November 26, 1996.

³³⁵ The system performance capabilities and planning factors include: 1) the signal-to-noise ratio (S/N) defining the outer limit of service; 2) co-channel desired-to-undesired interference ratios (D/U) for DTV-to-DTV, DTV-to-NTSC and NTSC-to-DTV signals; and, 3) the upper and lower adjacent channel D/U ratios for these same signal relationships. The specific system performance characteristics of the ATSC DTV system used in the development of the DTV Table are presented in Appendix A.

factors recommended by the Advisory Committee and the measured performance characteristics of the ATSC DTV system.³³⁶ We indicated that these evaluations consider the potential for interference between stations, particularly between stations operating on the same channel (co-channel interference) and stations operating on channels one frequency apart (adjacent channel interference).³³⁷ In addition, while our earlier studies had indicated that UHF taboo restrictions would not be needed for DTV allotments, the test results for the ATSC DTV system now indicate that certain taboo restrictions should be applied.³³⁸ We therefore proposed to take into account possible interference from DTV service to NTSC service on channels 2, 3, 4, 5, 7, 8, 14 and 15 channels removed from the channel under evaluation.

185. In the Fifth Further Notice of Proposed Rule Making (Fifth Further Notice) in this proceeding, which addressed the DTV technical standard, we proposed to adopt an emissions mask limiting out-of-channel emissions from a DTV station transmitter.³³⁹ Specifically, we proposed to require that: 1) at the channel edge, transmitter emissions must be attenuated no less than 35 dB below the average transmitted power; 2) more than 6 MHz from the channel edge, emissions must be attenuated no less than 71 dB below the average transmitted power; and 3) at any frequency between 0 and 6 MHz from the channel edge, emissions must be attenuated no less than the value determined by the following formula:

Attenuation in dB = $35 + [(\Delta f)^2/1.44]$; where: Δf = frequency difference in MHz from the edge of the channel

To protect against interference from an upper-adjacent channel DTV signal to reception of the

³³⁶ A description of the propagation models and service area planning factors are included with the system performance data in Appendix A.

³³⁷ The degree to which television stations interfere with one another depends in part on the ability of TV receivers to reject undesired signals in favor of a desired signal. The common measure of interference between stations is the ratio of the desired signal to the undesired signal (D/U ratio). Depending on receiver characteristics, unacceptable interference will occur when the D/U ratio between signals exceeds some level that is determined through testing. The D/U level at which unacceptable interference occurs varies depending on the channel relationship of the desired and undesired signals. In general, interference between stations can be managed by limiting the power of their signals, the height of their transmitting antennas and the distance between their transmitter locations. In the case of NTSC TV service, the Commission has managed interference between stations by requiring that the locations of co-channel and adjacent stations meet minimum geographic separation standards.

³³⁸ In addition to the co-channel and adjacent channel interference concerns, it is possible for stations operating on certain other combinations of channels, principally in the UHF band, to interfere with one another. Allotment constraints on these combinations are known as UHF taboos. In particular, these tests indicate that interference could occur from DTV to NTSC stations within a station's service area.

³³⁹ See Fifth Further Notice of Proposed Rule Making, MM Docket No. 87-268, 11 FCC Rcd 6235 (1996), at para. 56.

audio portion an NTSC signal, we proposed to require that, in such cases the ATSC DTV Standard pilot frequency be located 5.082138 MHz above the visual carrier of the lower adjacent channel NTSC station. We stated that this frequency difference would need to be maintained within a tolerance of +/- 3 Hz.³⁴⁰

186. Comments. The commenting parties address a variety of issues relating to our proposed methodology for allotting DTV channels. The Joint Broadcasters and the EIA support using the performance characteristics of the ATSC DTV system and the engineering planning factors recommended by the Advisory Committee.³⁴¹ The Joint Broadcasters also state that, based on a suggestion by Broadcast Caucus Technical Committee, we should include a dipole correction factor in the planning factors.³⁴² The EIA submits that if the DTV allotment plan is to replicate existing television service areas as proposed, the ACATS planning factors represent the only thorough assessment of how the DTV transition can be accomplished without reducing consumers' access to over-the-air television service. AFCCE recommends a different set of planning factors.³⁴³

187. The Joint Broadcasters, EIA, and FOX note that while the Advisory Committee recommended 10 dB be used for both the VHF and UHF as the receiver noise figures, we used 5 dB for VHF channels.³⁴⁴ The Joint Broadcasters contend that a 5 dB noise figure for VHF channels would underestimate the amount of "new" interference that caused to existing NTSC stations operating in the VHF band. EIA submits that a 5 dB VHF noise figure would raise the cost of DTV receivers. The Joint Broadcasters and Fox submit that we should use a 7 dB noise figure for UHF channels.³⁴⁵ The Joint Broadcasters state that this lower UHF noise figure has been recommended by the Broadcasters Caucus Technical Committee. Fox states that we should attempt to improve the UHF noise figure to 7 dB through the ongoing regulatory and negotiation process. Island also recommends that we use a lower UHF noise figure. It notes that several manufacturers now sell preamplifiers covering the entire UHF band that have noise figures below 3 dB and sell for under \$15 in quantity.³⁴⁶ AFCCE recommends that we assume use of a "smart antenna" that is integrated with a UHF low noise

³⁴⁰ See Fifth Further Notice, at para. 57.

³⁴¹ EIA comments, p. 3; Joint Broadcasters comments, pp. 11 and 44.

³⁴² Joint Broadcasters comments, p. 44.

³⁴³ AFCCE comments, p. 9. These proposals are based on a paper entitled "Planning Factors for HDTV Broadcasting- A Proposal" by committee member Oded Bendov, a copy of which is included with AFCCE's comments.

³⁴⁴ Joint Broadcasters comments, p. 19; Fox comments, p. 4; EIA comments, p. 3-4.

³⁴⁵ Joint Broadcasters comments, p. 44; Fox comments, p. 4.

³⁴⁶ Island comments, p. 10.

amplifier.³⁴⁷

188. The Joint Broadcasters support our proposal to use the terrain dependent Longley-Rice propagation methodology in measuring replication.³⁴⁸ Sunbelt Television, Inc. (STV) argues that our plan to use the Longley-Rice method for predicting service may cost some stations the rights they currently have to provide service to their entire Grade B contour as predicted under standard prediction methods.³⁴⁹ It is concerned that a station could lose the right to provide service to that entire area, through "fill-in" boosters and cable must carry rights, in situations where its new DTV Grade B service area does not match with its former Grade B predicted service area.

189. The Joint Broadcasters submit that in areas where there are not enough potential DTV channels to avoid DTV allotments adjacent to NTSC channels, we should assign adjacent channels to the same licensee.³⁵⁰ They argue that co-locating adjacent channels and assigning them to the same licensee is the only way to control interference to NTSC service. They further state that we should adopt a tight emissions mask to reduce out-of-band emissions. AFCCE argues that recent adjacent channel testing at the Advanced Television Test Center (ATTC) in Alexandria, VA, indicates that further review is needed of this issue, particularly in cases where adjacent channels are specified for paired NTSC/DTV use in the same market.³⁵¹ It believes that such adjacent channel use should be permitted with lower DTV power and/or significantly improved transmitter out-of-band attenuation relative to our proposed DTV transmission mask.³⁵² IBC and Mr. Smith express concern that making DTV allotments on channels adjacent to NTSC channels may not be workable.³⁵³ Mr. Smith states that in such situations both transmitters will need special filtering and will need to be locked together to a common frequency reference. Because of these factors, he states that it would make the most sense if both the NTSC and DTV transmitters were operated by a single

³⁴⁷ AFCCE comments, p. 9. These proposals are based on a paper entitled "Planning Factors for HDTV Broadcasting-A Proposal" by committee member Oded Bendov, a copy of which is included with AFCCE's comments.

³⁴⁸ Joint Broadcasters comments, p. 16.

³⁴⁹ STV comments, pp. 1-2.

³⁵⁰ Joint Broadcasters comments, pp. 21-22.

³⁵¹ See "An Evaluation of the FCC Proposed RF Mask for the Protection of Adjacent Channel NTSC Signals," Advanced Television Test Center (October 22, 1996). The Joint Broadcasters state that these tests indicate that use of the technical criteria recommended by the Advisory Committee with regard to allotment of adjacent channels in the same and neighboring markets will lead to significant interference to NTSC service within those markets.

³⁵² AFCCE comments, p. 11.

³⁵³ IBC comments, p. 2; Mr. Smith comments, pp. 4-5.

entity.

190. California Oregon Broadcasting, Inc. (COBI) argues that because the supply of potential DTV channels is limited, we should not limit adjacent channel assignments to the same licensee.³⁵⁴ It states that adoption of appropriate interference specifications or a requirement for mutual consent of both licensees would be adequate to protect the public and broadcasters' common interest in non-interference. COBI states that at a minimum we should allow assignment of adjacent NTSC and DTV channels where the licensees of both stations have agreed to the assignment.

191. CBA submits that the DTV technical rules should include a tighter emission mask and improved linearity requirements to minimize out-of-band emissions.³⁵⁵ It argues that modern transmitter technology will permit the application of techniques that allow equipment to meet more stringent limits in these areas. Acrodyne, a manufacturer of TV transmitter equipment, submits that with regard to band edge performance, filters in the traditional sense cannot be used to limit the signal level. It states that any improvement at the precise band edge must be brought about by DTV signal processing, probably at IF. It states that it would be very difficult and prohibitively expensive to require the band edge signal to be less than -35 dB.³⁵⁶

192. Finally, Joint Broadcasters note that an updated data base is needed to determine the most appropriate allotments for existing stations. They further observe that there are a great many inaccuracies in the data base that need to be corrected. To assist in the data correction effort, they include with their comments information on 150 corrections for the data base.

193. Decision. We are generally adopting our proposals to use the performance characteristics of the ATSC DTV system in developing DTV allotments and have used these characteristics in developing the DTV Table of Allotments adopted herein. We are also adopting the DTV allotment planning factors generally as proposed. We are, however, amending the proposed planning factors to take into account the concerns and suggestions presented by the Joint Broadcasters and other commenting parties. First, we have constructed the DTV Table of Allotments adopted herein using the new receiver noise figures recommended Broadcasters Caucus Technical Committee. That is, a 10 dB noise figure is used for the VHF band and a 7 dB noise figure is used for the UHF band. In addition, the Table takes into account the "dipole correction factor" for UHF frequencies recommended by the Joint Broadcasters.

194. As proposed, the allotments contained in the DTV Table are specified based on

³⁵⁴ COBI comments, p. 6-7.

³⁵⁵ CBA comments, pp. 11-12.

³⁵⁶ Acrodyne comments, p. 3.

service area replication. Service area replication, as defined by the broadcast industry and adopted herein, is based on a broadcast station's existing Grade B service taking into account both interference and propagation, using the Longley-Rice propagation prediction model. While we recognize that this may change the rights of certain broadcasters, as suggested by STV, we believe that this is the most equitable method of developing DTV allotments. We believe that these policies will generally address the concerns raised by STV.

195. We recognize the concerns expressed in the comments with regard to use of channels adjacent to existing NTSC stations for DTV allotments. As suggested by the commenting parties, in those cases where it is necessary to use adjacent channels in the same area, the Table pairs and co-locates adjacent NTSC and DTV channels to the extent possible. Furthermore, we are requiring that the adjacent channel DTV and NTSC carrier frequencies be locked to a common reference frequency.³⁵⁷ This operating requirement will help protect against interference to the NTSC signal, as recommended by the Advisory Committee.³⁵⁸ Finally, we will require that transmitter out-of-band emissions be attenuated consistent with the emissions mask proposed in the Fifth Further Notice.³⁵⁹ The original proposal to require 35 dB of attenuation at the band edge was based on the average power in a 500 kHz segment of the DTV channel. To correctly reference the total average power within a 6 MHz channel, we have modified this figure to 46 dB. Thus, we will require that: 1) at the channel edge, emissions must be attenuated no less than 46 dB below the average transmitted power; 2) more than 6 MHz from the channel edge, emissions must be attenuated no less than 71 dB below the average transmitted power; and 3) at any frequency between 0 and 6 MHz from the channel edge, emissions must be attenuated no less than the value determined by the following formula, which is based on a measurement bandwidth of 500 kHz:

$$\text{Attenuation in dB} = 46 + [(\Delta f)^2/1.44] ; \text{ where: } \Delta f = \text{frequency difference in MHz}$$

³⁵⁷ Specifically, we are requiring that the pilot frequency location of DTV signals with reference to the visual carrier of a lower adjacent channel NTSC station be located 5.082138 MHz above the visual carrier of the lower adjacent channel NTSC station and that this frequency difference to be maintained within a tolerance of ± 3 Hz.

³⁵⁸ See "Final Technical Report" of the Advisory Committee on Advance Television Service (1995), at Section 5.2.8. This reports indicates that "[w]ith regard to upper adjacent-channel interference ATV-into-NTSC, the tests found a 'color stripe' artifact in the NTSC video at all NTSC power levels. Analysis shows that it is caused by the ATV pilot carrier frequency 'beating' with the NTSC color subcarrier. Analysis also suggests that another 'luminance beat,' hidden during the testing by the color beat, would be present, caused by the ATV pilot carrier beating with the NTSC visual carrier. Finally, during these tests, some NTSC receivers showed loss of color and other picture artifacts. The analysis shows that use of precision carrier offset between the ATV pilot ant the NTSC color subcarrier will eliminate visibility of both artifacts." See also Annex to "Final Report and Recommendation of the Advisory Committee on Advanced Television Service," "Record of Test Results for Digital HDTV Grand Alliance System," (October, 1995), at Section I-14-67.

³⁵⁹ Consistent with these operating requirements, manufacturers and television station licensees are advised that DTV transmitters are subject to our equipment authorization requirements as set forth in Parts 2 and 73 of the rules.

from the edge of the channel.

196. Finally, we have updated the engineering data base used in generating the DTV Table to include new stations and station modifications granted as of the date of the adoption of this Report and Order. We have also made requested corrections to station data where those corrections are consistent with the authorized station facilities specified in our licensing records.

VI. DTV TABLE OF ALLOTMENTS

A. Allotment Computer Software

197. The development of a table of digital TV allotments is an extremely difficult and complex engineering and computational task. To handle this task, the staff of the Commission's Office of Engineering and Technology has developed sophisticated operations research methodology and computer software for optimizing the allotment of DTV channels. In addition, our staff and industry have worked together to incorporate methodologies for calculating the service area and interference considerations that are required under a service replication allotment approach. We used the allotment capabilities provided by this methodology and computer software in preparing both the draft and final versions of the DTV Table of Allotments.

198. The computer model developed by the FCC staff generates DTV allotments that optimize and balance the various policy objectives and proposals discussed above. The computer software incorporates an operations research optimization methodology known as "simulated annealing."³⁶⁰ This methodology employs a system of penalties that attach to conditions that fall short of specified objectives. The simulated annealing method seeks to minimize the sum of these penalties, or "costs," to achieve an optimum condition.

199. The computer model permits the rapid computation and analysis of service area coverage provided by the NTSC and DTV systems, both on an overall cumulative basis and for individual stations. The service area of an individual NTSC station is defined as the area within the station's Grade B service contour, reduced by any interference; and is computed based upon the actual transmitter location, power, and antenna height.³⁶¹ The service area of a DTV station is defined as the area contained within the station's noise-limited service contour, reduced by the interference within that contour. DTV coverage calculations assume locations and antenna heights identical to those of the replicated companion NTSC station and power generally sufficient to achieve noise-limited coverage equal to the companion station's Grade B coverage.

³⁶⁰ See David S. Johnson, Cecilia R. Aragon, Lyle A. McGeoch and Catherine Schevon, "Optimization by Simulated Annealing: An Experimental Evaluation, Part II (Graph Coloring and Number Partitioning)," Operations Research, Vol. 39, May-June 1991. In addition to the simulated annealing software, the staff has obtained software that incorporates a method known as "Lagrangian Relaxation." This method and its software implementation were developed by Decision-Science Applications, Inc. (DSA) under contract to the FCC. The DSA DTV allotment software is an extension of earlier work by DSA that produced the computer software used by the FCC to develop new FM radio allotments in MM Docket No. 80-90. The DSA software complements the simulated annealing software, and partial allotment solutions developed through either software package can be used in the other so that the two packages can be used together.

³⁶¹ The Grade B contour of analog TV broadcast stations is defined in Section 73.683 of our rules, see 47 CFR §73.683.

200. We also recognized that there may be instances where the allotment of channels in specific local situations can best be resolved on a case-by-case basis. Our allotment software therefore is able to merge specific local designs into complete tables and, where necessary, make changes in other allotments to preserve a balance of the specified policy considerations. This capability allows us to incorporate, where feasible, allotment/pairing agreements reached by broadcasters in negotiated settlements. In evaluating the feasibility of local agreements, we considered whether incorporation of given agreements would still allow us to meet our specified policy criteria.

B. DTV Allotments

201. The draft DTV Table of Allotments included in the Sixth Further Notice, showed possible DTV allotments and channels pairings for all eligible broadcast entities that would result from an allotment based on our core spectrum option with channels 7-51 specified as the core. We emphasized that this Table was a draft and that we anticipated revisions. The draft Table met all of our proposed principle objectives for allotment of DTV channels

202. Comments. A number of individual broadcasters requested changes in the allotments proposed for their stations on the draft Table.³⁶² In its comments, the LABCTS provide a sample alternative allotment table for the Southern California area that incorporates

³⁶² For example, parties requesting changes for one or more stations include: AK Media Group, Inc., Alaska Broadcasters Association, Allbritton Communications Company, Appalachian Broadcasting Corporation, Aries Telecommunication Corp., Blackstar, Channel 26, Green Bay WI, Central Missouri State University, Champlain Valley Telecasting, Inc., Channel 3 of Corpus Christi, Inc., Channel 51 of San Diego, Inc., Christian Communications of Chicagoland Inc., Coast TV, Costa de Oro Television, Inc., Dimension Broadcasting Company, L.L.C., Fouce Amusement Enterprises, Fox, Freedom Communications, Inc., Golden Orange Broadcasting Co., Inc., Grant Broadcasting Group, Great Trails Broadcasting Corporation, HSN, Inc., Hutchins Communications, Inc., Iberia Communications, L.L.C., Jovon Broadcasting Corporation, KADN Broadcasting, Inc., KLUR Television, KXII Broadcasters, Inc., Kern Educational Telecommunications Consortium, Lewis Broadcasting Corporation, Macon Urban Industries, Inc., Marsand, Inc., McGraw-Hill Broadcasting, Inc., Media Venture Management, Inc., Mid-State Television, Inc., Mountain States Broadcasting, Inc., New York Times Company, New York Times Company, Northwoods Educational Television Association, Pacific FM, Inc., Pikes Peak Broadcasting Company, Renaissance Communications Corp., Riverbank Restaurants, Inc., Santa Monica Community College District, Sarkes Tarzian, Inc., Scripps Howard Broadcasting Company, Scripps Howard Broadcasting Company, Second Generation of Iowa, Ltd., Shockley Communications Corporation, Sunbelt Communication Company, Tanana Valley Television Company, Telemundo Group, Inc., Tri-State Public Teleplex, Inc., Unicorn Communications, Univision Communications, Inc., Valley Channel 48, Inc., W. Russel Withers, Jr., WEAU License, Inc., WHDH-TV, Inc., WKYT Licensee Corp., WRNN-TV Associates Limited Partnership, WWWB-TV Company, Warwick Communications, Inc. Fox is also concerned that its stations WNYW-TV, New York, NY; WTXF-TV, Philadelphia, PA; WFLD-TV, Chicago, IL; and WJBK-TV, Detroit, MI would be short-spaced to new DTV allotments and would therefore be subject to interference from those stations. It requests that we revise allotments as necessary to resolve these interference concerns.

its policy recommendations.³⁶³ It states that in this sample alternative, only one station in all of Southern California would not be in the modified core spectrum it suggests and that there would be no interference to the existing land mobile operations. The ABA proposes a modified DTV allotment plan for the communities of Anchorage, Fairbanks and North Pole, Alaska.³⁶⁴ It states that pursuant to our suggestion, the Alaskan Broadcasters that currently operate full service TV stations in these communities have negotiated among themselves to create allotment and assignment pairings that they believe will allow them to provide future DTV service that is equal to, if not superior, in coverage to their current NTSC service. ABA further states that the broadcasters in these communities propose a cooperative co-location of their DTV transmitters. They state that the common sites for these transmitters will provide numerous benefits, including lower costs, allow orientation of receiver antennas towards a single site, minimize interference concerns, and reduce FAA and environmental concerns.

203. Cornell University, which manages and operates the Arecibo Radio Astronomy Laboratory in Arecibo, PR, requests that we revise the proposed DTV allotments of channel 38 at Christiansted, VI and channel 53 at Arecibo, PR to avoid interference to protect radio astronomy observations. In a "Technical Statement" accompanying its comments, Cornell submits a that DTV operations should not be permitted on channels 36, 38, 52, 53, or 54 in the vicinity of the radio astronomy observatories at Arecibo and at St. Croix, VI. The National Radio Astronomy Observatory, Socorro, NM (NRAO) is concerned that observations made with its Very Long Baseline Array (VLBA) and Very Large Array (VLA) radio telescope systems will be degraded by several of the DTV allotments proposed in the draft Table.³⁶⁵ The NRAO submits that its most serious concern is the proposed allotment of channel 38 at Christiansted, VI. The NRAO also submits that harmonic emissions from other DTV allotments on the draft Table present potential harmful interference conditions for its operations.³⁶⁶ It states that channels 11, 14, 25, 27, 28, 31, 46, 47, 48, 49, 50, 51, 52, 53, 54 and 69 have second or third harmonics that fall within allocated or footnoted radio astronomy bands and urges that we avoid creating DTV allotments on these channels in certain locations.

204. Decision. Our staff has worked with broadcasters and other parties to develop a final DTV Table of Allotments that incorporates the policy decisions on the allotment principles and engineering assumptions discussed above and addresses the concerns of

³⁶³ LABCTS comments, p. 4-5.

³⁶⁴ ABA comments, pp. 2-3.

³⁶⁵ The NRAO indicates that the VLBA facility consists of ten automated 25-meter dishes at ten sites across the U.S. and its territories, from Mauna Kea, HI to St. Croix, VI. Data from each receiver are combined in a special computer system allowing the synthesis of a single radio telescope 5000 Miles in diameter. The VLA facility consists of twenty-seven automated 25-meter radio telescope antennas, the data from which are combined in a manner similar to that of the VLBA facility.

³⁶⁶ NRAO comments, p. 4-5.

broadcasters and radio astronomy interests. To the extent possible, we have incorporated the allotment requests of individual broadcasters, radio astronomers, and others. The DTV Table of Allotments we are adopting is described below.

205. Full Accommodation. The DTV Table meets our primary objective of full accommodation of all eligible broadcasters.³⁶⁷ ³⁶⁸ The Table provides 1605 new DTV allotments in almost 900 communities in the continental U.S.³⁶⁹ This provides a DTV allotment for all eligible broadcasters as defined above. In addition, the DTV Table establishes 39 additional vacant DTV allotments reserved for non-commercial use, as discussed above.

206. DTV Service Areas. The DTV Table also fulfills our goals of service replication/maximization. In general, existing broadcasters will be provided with a DTV allotment that is capable of providing digital TV coverage of a geographic area that is comparable to their existing NTSC coverage.³⁷⁰ In fact, during the transition period, over 50% of all existing broadcasters would receive a DTV allotment that fully replicates their existing service area; and more than 93% would receive an allotment that replicates at least 95% of their existing service area. We also believe that the DTV Table meets our objective of minimizing new interference to NTSC service. For example, 98 to 99% of all NTSC stations will receive less than 10% new interference (in terms of both area and population

³⁶⁷ The single exception is Puerto Rico, where more than half the broadcasting channels are already allotted. (There are only 67 channels in the TV broadcast bands. Of these, 34 channels are operating or have been awarded construction permits and an application is on file for a 35th channel, all on an island whose size does not normally permit frequency reuse. Channel 37 is used for radio astronomy and therefore is not available for assignment to a broadcaster. This leaves 32 channels available as candidates for DTV allotments in Puerto Rico.) In developing the proposed allotments for Puerto Rico, we gave first priority to the operating stations. To make best use of the channels available, we included a DTV allotment of the same channel, 62, as that of the (ineligible) NTSC application in San Juan. The allotment is made to the station most distant (144 km or 90 miles) from San Juan, and the intervening terrain is mountainous. We were then left a small number of eligible stations having only construction permit status. Of the latter, only Fajardo channel 34 is in a multi-station community. We therefore choose, as in the Sixth Further Notice, to provide Fajardo with only two DTV allotments for the three stations there. In making this choice, we also considered that Fajardo is at the east end of the island, which affords the best chance of duplicating a west-end DTV channel through application of a case-by-case engineering analysis.

³⁶⁸ We also note that some of the channels specified in the draft table are not fully compliant with the existing U.S.-Mexican and U.S.-Canadian agreements. We are continuing to work with these administrations to finalize the status of DTV allotments in border areas.

³⁶⁹ The DTV Table also includes allotments for Alaska, Hawaii, Puerto Rico and the Virgin Islands.

³⁷⁰ For each allotment, the DTV Table, in general, specifies the maximum ERP needed to replicate a station's existing service area. This power level is based on the station's existing antenna height and pattern.

served) from DTV operations.³⁷¹

207. Spectrum for DTV Allotments. The DTV Table also meets our spectrum goals of providing all eligible broadcasters with a suitable DTV allotment and for ensuring that the spectrum is used efficiently. Based on our analysis of the proposed Table, all eligible broadcasters eventually will have access to a suitable DTV frequency within the spectrum area ultimately designated for digital TV, e.g., existing TV channels either 7-51 or 2-46. As indicated above, the DTV Table contains 68 instances where both channels are outside of channels 7-51 and 89 instances where both channels are outside of channels 2-46. Even in these cases, however, suitable channels within the core area will become available when NTSC operations cease and channels are recovered from other stations.

VII. ALLOTMENT MODIFICATIONS

A. Maximum Station Facilities

208. In the Sixth Further Notice, we indicated our view that new stations that operate on DTV allotments created after the initial Table should also be authorized sufficient technical facilities to enable them to serve their communities of license as well as an area around those communities comparable to the service areas of typical NTSC stations. We therefore proposed to specify a maximum permissible power of 316 kW effective radiated power and a maximum antenna height of 2000 feet height above average terrain for stations that operate on new UHF DTV allotments created subsequent to the initial Table. Our proposed maximum permissible ERP and HAAT specifications for future DTV allotments would allow a station to serve a geographic area with a radius of up to 107 km (about 66 miles), which corresponds to the predicted Grade B service area of an NTSC station operating at maximum power and HAAT on a UHF channel. We observed that at antenna heights lower than the proposed 2000-foot maximum, additional power would be needed to serve a geographic area of this size. We therefore proposed to allow DTV stations to operate with higher ERP levels at lower antenna HAAT levels in accordance with the following table.³⁷²

³⁷¹ These estimates are based on terrain-dependent Longley-Rice propagation models and assume that all NTSC and DTV stations are in operation.

³⁷² For antenna heights 1600 feet and below, the maximum permissible power would be slightly less than the level needed to fully serve the area within a 107 km radius. This adjustment is necessary to avoid the potential for increasing interference to neighboring co-channel stations.

Proposed Maximum Allowable ERP and Antenna Height
for Future DTV Stations

Antenna HAAT (feet)	Effective Radiated Power (kW)
2000	316
1900	400
1800	450
1700	500
1600	600
1500	700
1200	1000
1000	1500
700	2500
500	3000

209. Finally, we noted that Section 73.614 of the rules provides formulas for calculating the maximum permissible ERP where a station's antenna exceeds the 2000 feet maximum.³⁷³ We stated that we believe a similar approach would be appropriate for DTV stations. We requested suggestions for the appropriate HAAT/power equivalency formulas to use for such DTV stations.

210. Comments. Only a few parties commented on this issue. Aries supports our proposals regarding maximum and minimum power levels.³⁷⁴ Aries believes that our proposal would assist in equalizing service areas among stations. LeSEA supports limiting DTV power levels to 1500 kw at 1000 feet HAAT and pro-rating it in accordance with the proposed Maximum Allowable ERP and Antenna Height Table.³⁷⁵ It believes this revision of the permissible power levels would help reduce the power disparities that are present in the draft Table. The Joint Broadcasters argue that limits on maximum facilities are unnecessary so

³⁷³ See 47 CFR 76.614.

³⁷⁴ Aries comments, p. 2.

³⁷⁵ LeSEA comments, p. 5.

long as we use an allotment approach that protects DTV station service contours.³⁷⁶ They believe that use of maximum power levels may unnecessarily cap stations' ability to achieve greater service areas. As noted above, the Broadcasters Caucus support a two-year temporary limit on maximum power. They indicate that the industry could not, however, agree on what power limit should be imposed during this period, either 500 kW or 1000 kW.³⁷⁷

211. Telemundo submits that we could improve service to urban audiences by permitting UHF stations to calculate maximum ERP levels at their contour edge.³⁷⁸ Specifically, Telemundo states that UHF stations should be allowed to calculate their ERP at the depression angle to their DTV contour (43.8 dBu). Under this plan, if a station were to use a directional antenna, it would calculate its ERP at the radial to the most distant point on the DTV coverage contour. Telemundo also states that stations should be allowed to use beam tilt to improve coverage inside their coverage areas, even if it results in higher ERP levels than those specified on the draft Table.

212. The ABA urges that we adopt flexible minimum power levels for DTV operations.³⁷⁹ The ABA states that because the small population of Alaska is concentrated in its metropolitan areas and there are vast areas with little or no human habitation, it would better serve the public interest to initially allow UHF stations to operate at a lower ERP than we proposed. It states that this would allow stations to implement DTV service at lower power levels and avoid the high costs predicted for some UHF transmitters.

213. Decision. In the Sixth Further Notice, we proposed a maximum permissible power of 316 kW effective radiated power and a maximum antenna height of 2000 feet height above average terrain for new DTV allotments in the UHF band. We proposed an equivalency table for various power (ERP) and antenna height (HAAT) combinations to permit increased power at antenna heights under 2000 feet. We indicated that these maximum facility values will enable a DTV station to serve their communities of license and provide service comparable to the service areas of typical NTSC stations. We are generally adopting these proposals. However, consistent with our service replication decision above, we are at this time limiting the maximum power to 1000 kW, regardless of antenna height, and are amending our power (ERP)/antenna height (HAAT) table accordingly, as shown in Appendix E. In addition, as set forth in the rules in Appendix E, we are adopting equivalent power and antenna height provisions for new DTV allotments for VHF channels. We are also providing different power levels for Zone I and Zones II and III, similar to our rules for NTSC service.

³⁷⁶ Joint Broadcasters comments, p. 44

³⁷⁷ Broadcasters Caucus reply comments, pp. 13-16.

³⁷⁸ Telemundo comments, p. 22.

³⁷⁹ ABA comments, pp. 3-4.

B. Future Allotments and Modifications to the DTV Table

214. In the Sixth Further Notice, we requested comment on what approach or approaches should be used for the purpose of adding future DTV allotments and modifying the initial DTV Table. Specifically, we requested comment on whether an approach that uses minimum geographical spacing distances similar to what is now used for NTSC allotment changes or an approach that uses engineering criteria to show that the new allotment does not cause additional interference to other allotments or stations would be more appropriate for DTV.

215. Based on the engineering performance characteristics of the ATSC DTV system that we used in generating the draft DTV Table, we developed the following proposals as possible spacing standards for determining whether to permit the addition or modification of DTV allotments.³⁸⁰

<u>Channel Relationship</u>	<u>Separation Requirement</u>
VHF Channels 7-13	
Co-channel, DTV to DTV	
Zone I	152 miles (244.6 km)
Zones II & III	170 miles (273.6 km)
Co-channel, DTV to NTSC	
Zone I	152 miles (244.6 km)
Zone II & III	170 miles (273.6 km)
Adjacent Channel	
DTV to DTV	No allotments permitted between:
Zone I	25 miles (40.2 km) and 60 miles (96.6 km)
Zones II & III	30 miles (48.3 km) and 60 miles (96.6 km)
DTV to NTSC	No allotments permitted between:
Zone I	7 miles (11.3 km) and 71 miles (114.3 km)
Zone II & III	11 miles (17.7 km) and 91 miles (146.4 km)
UHF Channels	
Co-channel, DTV to DTV	
Zone I	122 miles (196.3 km)
Zone II & III	139 miles (223.7 km)

³⁸⁰ Proposals for new DTV allotments would also be subject to other requirements and standards for new allotments set forth in Sections 73.610 and 73.611 of our rules, see 47 CFR §§73.610 and 73.611. The DTV to NTSC minimum spacing requirements would apply only during the transition period.

Co-channel, DTV to NTSC

Zone I	135 miles (217.3 km)
Zone II & III	152 miles (244.6 km)

Adjacent Channel

DTV to DTV

All Zones	No allotments permitted between: 20 miles (32.2 km) and 55 miles (88.5 km)
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DTV to NTSC

All Zones	No allotments permitted between: 6 miles (9.7 km) and 55 miles (88.5 km)
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Taboo Channels, DTV to NTSC only

(+/- 2, +/- 3, +/- 4, +/- 5,
+/- 7, +/- 8, +/- 14 and
+/- 15 channels)

	No allotments permitted between:
Zone I	15 miles (24.1 km) and 50 miles (80.5 km)
Zone II & III	15 miles (24.1 km) and 60 miles (96.6 km)

216. Alternatively, we proposed to require that a party requesting an addition to, or modification of, the DTV Table show that a station operating at the maximum permissible ERP and antenna height on the proposed allotment would not exceed the engineering interference criteria with regard to any other existing allotment. Under this approach, the engineering criteria would be specified in terms of desired-to-undesired signal ratios and would include consideration of potential interference to a station operating on the proposed allotment as well as potential interference from a station operating on the allotment to stations operating on other allotments. All evaluations of interference would be made under the assumption that stations on the allotments involved would be operating at the maximum allowed power and antenna height. We would use the same propagation models, technical planning factors and DTV system performance characteristics in performing engineering evaluations of interference that we used in developing our proposals for the DTV Table and allotment spacing criteria.³⁸¹ The engineering evaluations would therefore examine possible interference between DTV service and between DTV and NTSC service on channels 2, 3, 4, 5, 7, 8, 14, and 15 channels removed from the channel under evaluation.

217. We observed that the proposed new service replication allotment methodology would result in a number of DTV allotments that are at distances to other DTV allotments and existing stations that are less than our proposed spacing standards. We stated that while such "short-spaced" or non-conforming allotments are necessary to achieve our full accommodation objective, we continue to believe that it is desirable to minimize the use of

³⁸¹ The propagation models, technical planning factors and ATSC DTV system performance characteristics are presented in Appendix A.

short-spacing and its effect on neighboring stations. We therefore proposed to make short-spaced or non-conforming allotments only during the initial assignment phase for existing stations, so that subsequent additions to the DTV Table for stations to be operated by new applicants would be required to comply with the minimum spacing or engineering requirements. We also proposed to delete all short-spaced allotments that have not been activated by an eligible broadcaster after the initial application period. For purposes of this proposal, an allotment would be considered short-spaced if it does not meet the spacing standards or engineering criteria for new DTV allotments.

218. Comments. Century, KUPN-TV and Mr. Smith support the use of a geographic spacing approach for evaluating the acceptability of future DTV allotments.³⁸² KUPN-TV submits that spacing standards have proven efficient and reliable in use with NTSC service and would not impose a burden on future petitioners. Century states that we should adopt a spacing approach to remain consistent with the spacing methodology used in treaties with Canada and Mexico. It is concerned that allotments otherwise acceptable under interference standards might not be allowed due to an unwaivable geographic spacing conflict with Mexican or Canadian stations. Mr. Smith submits that we should allot DTV channels using a geographic spacing approach that would allow stations to maximize their coverage up to the current limits. He states that use of engineering studies to allot channels has in the past resulted in short-spacing of stations which in turn curtails the upgrading of stations. He believes that all stations should have the option of being able to upgrade to similar coverage.

219. The Joint Broadcasters recommend that we consider the following factors in evaluating proposals for a DTV channel or facility change: 1) spectrum and administrative efficiency; 2) preservation of NTSC service; 3) expansion of DTV service; and 4) interference to neighboring stations.³⁸³ They state that these factors would also be considered by the regional industry coordinating committees in their evaluation of requests for changes. Pappas disagrees with the Joint Broadcasters' proposal to maintain the service replication principle after the transition is completed.³⁸⁴ It argues that replication, as opposed to maximization, is a means to address the problem of accommodating all television broadcasters during the transition, when available spectrum will be at a premium. Pappas submits that once the transition is over, there should be ample spectrum available to enable broadcasters to maximize their coverage and hence to maximize their service to the public.

220. With regard to making additional channels available for new DTV stations, the Joint Broadcasters and Chris-Craft argue that we should refrain from assigning unassigned

³⁸² Century comments, p. 3; KUPN-TV comments, p. 2; Mr. Smith comments, p. 4.

³⁸³ Joint Broadcasters comments, p. 56.

³⁸⁴ Pappas comments, p. 11-12.

DTV channels or making new allotments throughout the DTV construction period.³⁸⁵ They state that this will allow the existing licensees the flexibility needed to make DTV channel changes and otherwise respond to external circumstances and new information about DTV service characteristics. Chris-Craft argues that during this time existing stations should be able to seek changes to their initial allotments without the risk of facing competing applications for new stations and should have a priority that would allow them to change their DTV channels to that of an unbuilt allotment in the same or adjacent market. The Joint Broadcasters state that after that point, we should accept requests for new allotments subject to protection of the service contours of assigned DTV and NTSC stations. Under this approach, new channels would be allotted based on the criterion that they do not create new interference.

221. Decision. As an interim measure until we have more extensive experience with the implementation of DTV by existing broadcasters, we are adopting our spacing proposals as the criteria for adding future DTV allotments. Geographic spacing provides a clear and simple measure of acceptability of an allotment proposal without the need to engage in extensive analysis of interference and has been used successfully in the television service for many years. We recognize that engineering criteria may allow more efficient use of the spectrum and we therefore plan to revisit our allotment criteria at an appropriate point later in the DTV transition process.

222. With regard to modification of allotments, we will use the same engineering technical criteria that we have used in developing the DTV Table. We will require that a party requesting a modification of the DTV Table show that such modification would not result in any new predicted interference to other DTV allotments or existing NTSC stations. Under this approach, any request for modification must include an engineering showing indicating that no new interference would be caused. The engineering evaluations should examine possible interference between DTV service and between DTV and NTSC service on channels 2, 3, 4, 5, 7, 8, 14, and 15 channels removed from the channel under evaluation in accordance with the rules set forth in Appendix E.

VIII. PROCEDURAL MATTERS

223. Paperwork Reduction Act of 1995 Analysis. The decision herein has been analyzed with respect to the Paperwork Reduction Act of 1995, Pub. L. 104-13, and found to propose or impose no modified information collection requirements on the public.

224. Final Regulatory Flexibility Analysis. As required by the Regulatory Flexibility

³⁸⁵ Joint Broadcasters comments, pp. 52-53; Chris-Craft comments, pp. 7-8.

Act,³⁸⁶ the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) of the expected impact on small entities of the rules in this document. The FRFA is set forth as Appendix D.

225. Ordering Clauses. In accordance with the actions described herein, IT IS ORDERED THAT Part 73 of the Commission's rules ARE AMENDED as set forth in Appendix E. IT IS FURTHER ORDERED THAT eligible broadcasters are offered the opportunity to apply for digital TV allotments paired with their existing NTSC channels in accordance with the allotment plan and associated technical specifications set forth in Appendix B, and the procedures set forth in our Fifth Report and Order in this proceeding, FCC 97-116, adopted April 3, 1997. This action is taken pursuant to authority contained in Sections 4(i), 7, 301, 302, 303, 307 and 336 of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 157, 301, 302, 303, 307 and 336.

226. IT IS FURTHER ORDERED THAT, pursuant to the Contract with America Advancement Act of 1996, the rule amendments set forth in Appendix E SHALL BE EFFECTIVE either 30 days after publication in the Federal Register or after the receipt by Congress and the General Accounting Office of a report in compliance with the Contract with America Advancement Act of 1996, Pub. L. No. 104-121, whichever is later.

227. For additional information concerning this matter, contact Bruce Franca, Office of Engineering and Technology, (202) 418-2470, Alan Stillwell, Office of Engineering and Technology, (202) 418-2470, or Robert Eckert, Office of Engineering and Technology, Technical Research Branch, (202) 418-2433.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary

³⁸⁶ See 5 U.S.C. § 604.